



WHITE PAPER

Best Practices for Installing and Configuring the Captaris® RightFax® 9.3 Shared Services Module

*Taking Advantage of Multiple RightFax Servers Sharing
a Single Database*

PREFACE

Captaris has created this technical white paper to provide best-practices guidelines for configuring multiple Captaris RightFax 9.3 Servers to share a single Microsoft SQL Server database. This information applies only to RightFax 9.3 and is not applicable to prior versions of the product.

The RightFax product family supports a wide variety of configurations. Before acting on any recommendations in this document, you should consult with your Captaris partner to plan a system that supports your needs.

TARGET AUDIENCE

This paper is intended for technical readers in end-user organizations and in the reseller or partner organizations that support those end-users. System architects, senior administrators, systems planners, sales engineers and systems engineers will gain the most from this paper. Other documents that focus on features and business benefits of the RightFax Shared Services module are available separately.

DEFINITIONS

Cluster Several servers sharing specific common services. Used in this paper to specifically describe either a *Microsoft Windows Server Cluster* or a *Microsoft SQL Server Cluster*. The term "cluster" is not used in any generic sense in this paper.

Collective (or "RightFax Server collective") Several RightFax Servers in a specific configuration sharing a common *RightFax database*. A "collective" may be implemented on a Windows Server cluster but does not have to be. The term "collective" refers to this shared configuration in the aggregate and not specifically to any RightFax Server or the RightFax database in the collective.

RightFax database A database managed by Microsoft SQL Server that is used by a RightFax Server or a RightFax Server Collective.

SQL Server Refers to Microsoft SQL Server, specifically an instance installed and configured to manage at least one RightFax database.

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Introduction

The capacity of a RightFax Server can now be multiplied by combining two or more servers that share a common RightFax database, in a "RightFax Server Collective." Sharing a common database provides the following architectural and systems benefits:

- Throughput for sending faxes increases because internal loads are shared among some of the fax server services.
- Multiple RightFax Servers share all of the data in the RightFax database—users, delegates, phonebook entries, distribution lists and document data such as fax status. The data is available to all the administrators and clients in the network. Furthermore, administrators manage this information in one central location for all servers in the shared configuration.
- All received faxes are stored on the SQL Server and are available to all clients in the network.
- A common database helps maintain integrity of RightFax data.
- Redundant data is eliminated, saving storage space.
- Scalability is ensured; the RightFax software does not limit the number of RightFax Servers that can share a common database.
- Loads are balanced across the collective. RightFax services are shared by multiple machines to balance the workload from many RightFax clients.

These capabilities are available in the Shared Services Module, an option that is available for all RightFax 9.3 Enterprise Server packages. Up-to-four servers are supported in this shared database configuration, a "collective."

Features of RightFax Server Collectives

FAX VOLUME CAPACITY INCREASES

With multiple RightFax Servers sharing a RightFax database, the capacity for inbound and outbound faxing is bound by the following system characteristics:

- Qualities of the hardware
- Network capacity
- SQL Server capacity
- Method of submitting documents to RightFax, listed from fastest to slowest:
 - Applications submitting documents to the RightFax Server via the RightFax API or COM API.
 - RightFax printer queue (e.g., embedded codes, print-to-fax, HPFAX queue).
 - RightFax Integration Module (with a greater server load that requires more server resources.)

Each RightFax Server supports up-to-1,024 fax channels. Expect to see a near-linear increase in throughput with each added RightFax Server added to the collective.

Captaris has tested and supports this shared database configuration with up-to-four RightFax Servers and one remote Workserver sharing one RightFax database.

RIGHTFAX SERVERS SHARE RESOURCES

Resource folders containing items such as fax images and cover sheets are shared among all the RightFax Servers in the shared database configuration. The shared folders can be located on a high-availability server such as a clustered server or a Storage Area Network (SAN).

RIGHTFAX STORES THE EVENT QUEUE IN SQL

Prior to RightFax 9.3, the RightFax Server module stored fax events in memory. When the server module stopped, all events in memory were lost. When the server module was restarted, its first task would be to rebuild the event queue, a task which necessarily preceded processing of any pending inbound or outbound documents.

The RightFax event queue is now stored in the RightFax database on the SQL Server, and thus it is shared among all of the RightFax Servers in a shared configuration. The queue is persistent. That is, it retains its objects and values if the RightFax Servers stop.

The events in the queue are shared among the RightFax Servers in the system. Job processing is shared and balanced among all the servers in the system. Individual jobs may be processed on the RightFax Server that started it, or it may be processed on another server with available capacity.

RIGHTFAX STORES RECEIPT INFORMATION IN SQL

Prior to RightFax 9.3, the RightFax Server module queried the DocTransport module to check for new documents. In turn, the DocTransport module checked the activity log on the SQL Server. If it found a new document, it converted the document from an IPK file to a Tagged Image File (TIF) G3 file and copied it to the RightFax Server module. During this process, the RightFax Server module waited for a result.

To increase the speed of processing received documents RightFax 9.3 uses a *received document queue*, now stored and managed in the RightFax database. In a RightFax Server Collective, a single *received document queue* is shared by all RightFax Servers in the shared configuration.

RightFax Servers query the *received document queue* in the RightFax database for received documents. They no longer directly query the DocTransport module and wait while new documents are processed and sent to it.

DocTransport modules in the shared services configuration monitor the activity log in the RightFax database for new documents. If new documents are found, a DocTransport module converts and copies the received documents to the Image directory, which is shared by the servers in the configuration.

The DocTransport module inserts receipt information into the received document queue. The RightFax Server reads and removes entries from the queue.

REMOTE SERVICES DISTRIBUTE WORKLOAD

The following RightFax services can be installed remotely on computers to distribute workload:

- DocTransport, which specifies the methods by which documents will be transmitted, via fax board, Fax over IP or DOCplus. It converts and copies received documents to the Image directory.
- BoardServer, which communicates between the RightFax Server and fax boards
- Workserver, which performs processor-intensive functions such as cover sheet generation, print-to-fax conversion and optical character recognition.

RightFax fax board services can be installed on remote servers to distribute the workload across several computers and to provide expanded channel capacity and system redundancy.

To support remote fax board services the DocTransport and BoardServer services are installed together on the remote computer.

RightFax Servers sharing a database can work with remote and local BoardServer modules. While remote BoardServers are installed with a particular RightFax Server, the load produced by the collective is distributed across all available BoardServers.

Refer to Figure 2 and Figure 3 for illustrations.

SERVER TOPOLOGY

Figures 1 through 4 show some example configurations with the RightFax Shared Services module.

Figure 1. Two RightFax Servers share a SQL database. Common disk storage is used to store shared RightFax resources.

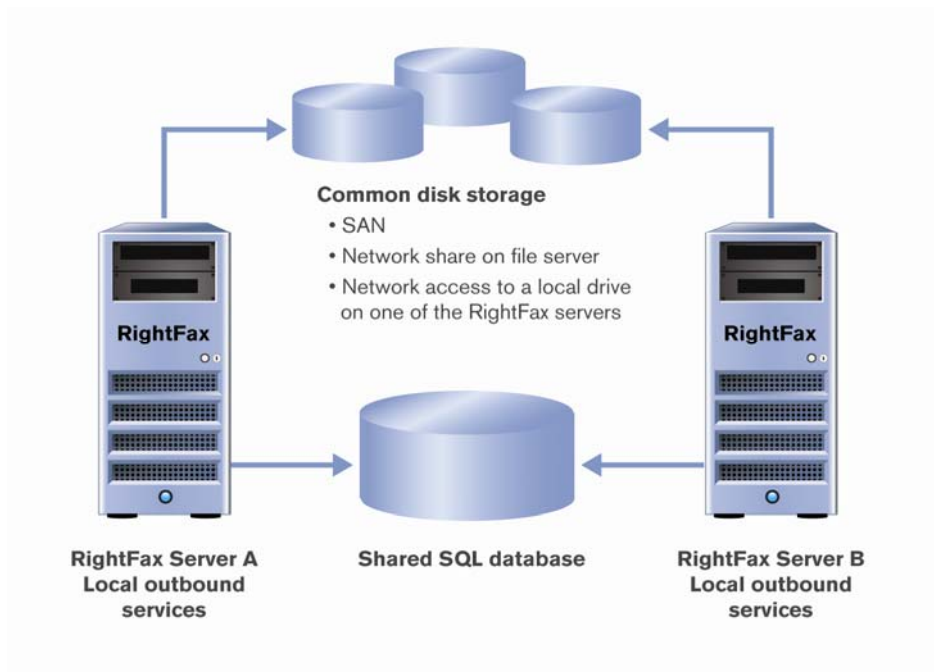
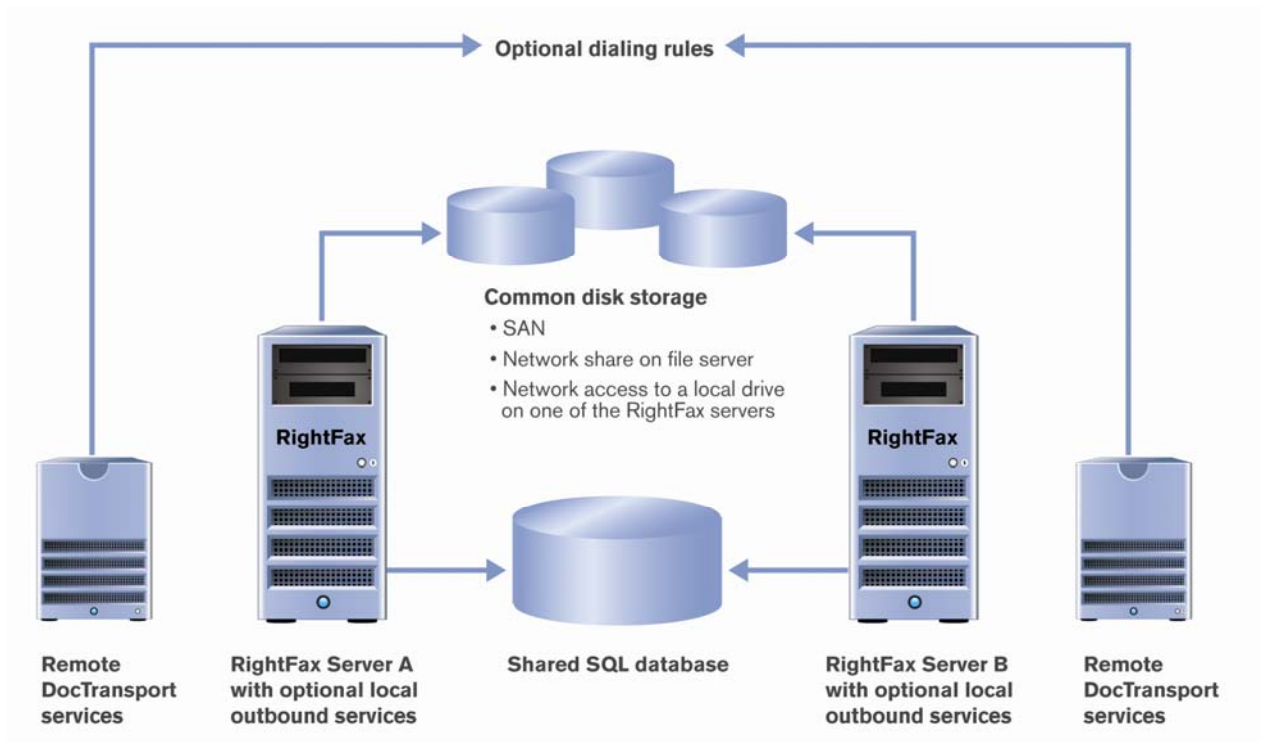
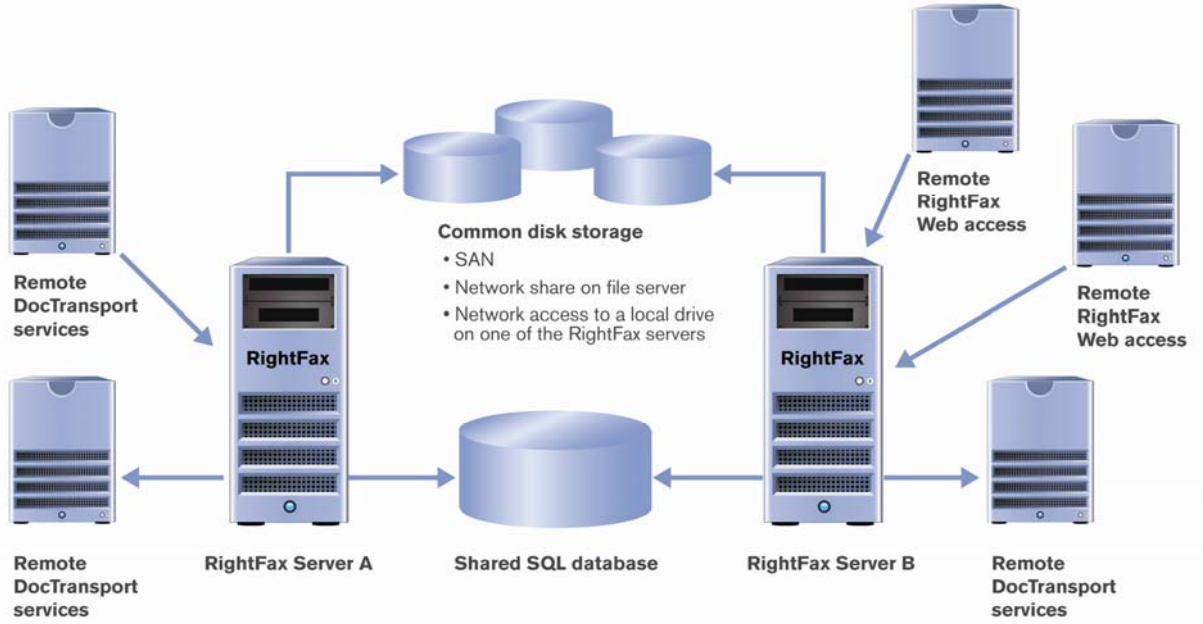


Figure 2. Two RightFax Servers share a SQL database.



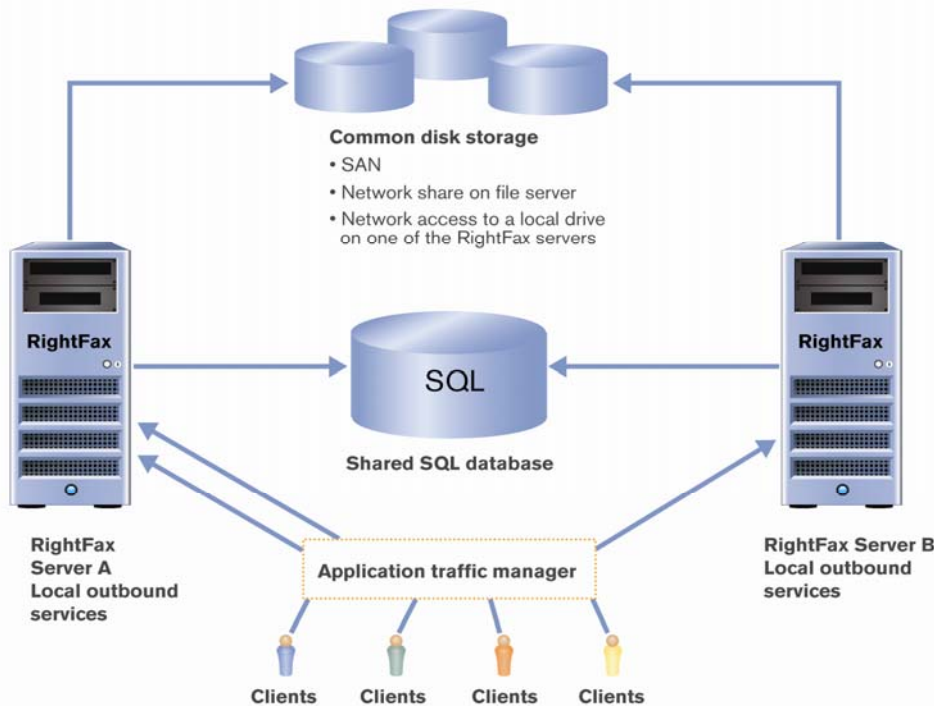
DocTransport services are located on remote servers to offload processing from their respective RightFax Servers. Dialing rules specify the DocTransport services and RightFax Servers from which documents will be sent. Dialing rules are specific to each RightFax Server and are not shared. Common disk storage is used to store shared RightFax resources.

Figure 3. Two RightFax Servers share a database.



Remote services such as DocTransports, Workservers and alerting and monitoring offload processing from the RightFax Servers. RightFax Web Access is installed with Microsoft Internet Information Server on a remote computer. Common disk storage is used to store shared RightFax resources.

Figure 4. Two RightFax Servers share a database.



Common disk storage is used to store shared RightFax resources. An application traffic manager directs RightFax client traffic to available RightFax Servers. Application traffic manager vendors include F5 Corporation (BIG-IP products), Foundry Networks and Packeteer, among others.

GEOGRAPHIC DISTRIBUTION OF SERVICES

While servers in a collective may be geographically dispersed over a Wide Area Network (WAN), this configuration has not been tested by Captaris, and is not a recommended architecture at this time.

MEETING AVAILABILITY GOALS

RightFax performs a business-critical role in most organizations. Information Technology (IT) organizations must develop strategies for maintaining high levels of availability for business applications, such as RightFax. IT planners must anticipate and plan for the following situations to achieve their availability goals:

- Planned downtime due to hardware and software upgrades, service packs or security patching
- Unexpected hardware and software failures
- Infrastructure failures and natural disasters

TAKING A SERVER OFFLINE

If a server must be taken offline for maintenance or a software upgrade, then all the servers in the shared configuration should be taken offline simultaneously. A single RightFax Server in a shared system should not be running against the database during an installation because the installation may make changes to the database which could cause unexpected results on the remaining servers. Servers need not be restarted simultaneously.

PLANNING FOR STABILITY AND REDUNDANCY

For database integrity and stability, ensure that your Microsoft SQL Server database implementation is reliable, scalable and includes data protection features. The base product's built-in availability features are a starting point. Reliability depends upon planning and best practices in implementing the database. Please refer to the extensive material available online from Microsoft on proper configuration and management of SQL Server installations.

For redundant operations and disaster recovery, each RightFax Server can be clustered in a Windows server cluster. If you choose Windows SQL Server, it, too, can be clustered.

Active-active clustering of RightFax Servers is not supported in this release.

IF A RIGHTFAX SERVER FAILS

If a RightFax Server in a shared configuration fails, the outgoing jobs that are in process will be processed by other RightFax Servers in the shared configuration.

Each RightFax client application submits faxes to a specific server that is defined for the client. If a RightFax Server fails, users of that server (end-users and applications that interface with RightFax) should be directed to send faxes via another server.

An application traffic manager can direct RightFax client traffic to the available RightFax Servers.

Best Practices for Installing and Configuring a RightFax Server Collective

INSTALLING RIGHTFAX SERVERS TO SHARE A RIGHTFAX DATABASE

To install multiple RightFax Servers that share a database complete the following general steps:

1. If you are upgrading from an earlier version of RightFax, print or make a copy of the Windows registry key HKEY_LOCAL_MACHINE\Software\RightFax so that you have a copy of any changes that have been made to customize the system. In a typical shared database configuration, customizations should be identical on each RightFax Server.
2. Install the RightFax Server on the first RightFax Server computer. Define the database as you are prompted during the installation.
3. Activate licensed features on the first RightFax Server computer.
4. On the second RightFax Server computer, run the RightFax Server installation program.
5. During the installation, point the second RightFax Server to the database that you defined when you installed the first RightFax Server.
6. During the installation, you will be prompted to wipe out the existing database or append to the existing database. Set to Append.
7. Activate licensed features on the second RightFax Server, as described in step 2. To avoid license conflicts and violations all of the RightFax Servers in a collective must have the same licensed features activated.
8. Repeat steps 4 through 7 for each added RightFax Server.

Note: This list is a general guide only. Please refer to the *RightFax 9.3 Installation Guide* for comprehensive installation instructions.

CREATING UNIQUE WORKSERVER PRINTERS

Workserver printers convert documents to image files through Server Side Application (SSA) conversion and the Outside In engine (from INSO Corporation). Workserver printers must be configured to be unique on each node and should never be shared.

PROVIDING ACCESS TO SHARED RESOURCE FOLDERS

The following folders are shared among all the RightFax Servers in the shared database configuration:

- **Image** Contains sent and received faxes stored as compressed graphic image files
- **SIG** Contains graphic images of user signatures for placement on faxes
- **Papers** Contains the overlay form files
- **FCS** Contains fax cover sheets

- **Outgoing** Contains outbound files from all submission methods that are held while being processed into fax images, such as temporary fax queue spool files
- **BFT** Contains text files created by the OCR process
- **CmdData** Contains transaction files for each fax sent via email or via SecureDocs

The folders can be located in common disk storage, such as a SAN, network share on file server or network access to a local drive on one of the RightFax Servers. The folders must be accessible to all the servers in the shared configuration.

On each RightFax Server, create shared access to these files using the RightFax Server Configuration dialog box, Data Sharing tab.

Access to these locations can be expressed differently for each server by permissions and network layout. Each server can be configured to use unique paths and user accounts to the same storage location for each type of resource file.

Services that directly access image and other files must be given service accounts with access to the specified paths.

Example:

Server A accesses a local SAN using the path S:\RightFax\Image. In order for RightFax services to access the path, server B uses the local system account.

From a remote location, server B accesses the same SAN using the path \\ServerA\RightFax\Image. In order for RightFax services to access the path, server B must use an account that has permissions to access that network path (such as, DomainA\RightFax).

CONFIGURING REMOTE SERVICES

The following RightFax services can be installed on remote computers:

- DocTransport, which specifies the methods by which documents will be transmitted, and converts and copies received documents to the Image directory.
- BoardServer, which communicates between the RightFax Server and fax boards.
- Workserver, which performs processor-intensive functions such as cover sheet generation, print-to-fax conversion and OCR.

To support remote fax board services the DocTransport service must be installed and the BoardServer transport method must be configured on remote DocTransport computers.

One or more discrete DocTransport modules must be defined on each RightFax Server. That is, whether local or remote, DocTransport modules must be discrete and may not be shared. A remote DocTransport module connects to exactly one RightFax Server. On each RightFax Server, the DocTransport module must be configured with a minimum of one transport method. You may choose to dedicate a RightFax Server to processing and sharing workload and may choose to not install fax boards on that server. In such a case, use dialing rules to transfer outgoing traffic to a different server.

A remote Workserver can connect to one RightFax Server. It cannot access multiple RightFax Servers.

Refer to Figure 2 for a basic illustration of remote services.

USING DIALING RULES

A fax may be sent by any RightFax Server using the shared database; it will not necessarily be processed and delivered by the RightFax Server that initially received the job.

To specify that a fax be sent from a specific RightFax Server use dialing rules. Use the **Rule Edit** dialog box, **Destination** tab, **Send via Fax Server** option to specify the RightFax Server for sending documents.

To specify that a document be sent by a particular DocTransport module use dialing rules to transfer the job to the DocTransport module. The DocTransport can be set in the dialing rules **Rule Edit** dialog box, **Destination** tab, **Send Via Transport** option.

Refer to Figure 3 for a basic illustration.

Daily Maintenance that RightFax Performs on the RightFax Database

Maintenance is a collection of tasks that occurs once a day to clean up the RightFax database. Typically, maintenance is performed each night at 2 a.m. The time can be specified by the RightFax administrator.

AGING AND PURGING

The aging and purging process consists of two steps: marking and deleting.

Aging evaluates the age of each document on the RightFax Server.

When a document exceeds the age limit, it is marked for deletion. The marked documents will later be deleted by the purge process. Documents that are marked for deletion can be recovered until they are purged.

- The age limit for documents is defined for each RightFax user group by the RightFax administrator.
- Documents that are marked for deletion can be queried for reports.

Purging removes documents marked for deletion that are older than the configured limit. Purging deletes both the record of this document in the RightFax database and the corresponding image files that are stored in the Image directories on the RightFax Servers in the collective.

One event triggers the aging and purging process.

ORPHAN SCANNING

The orphan process scans the RightFax\Image directories on the RightFax Servers for fax image files that are not referenced by any document or library document in the RightFax database. This can happen if the purging process is interrupted (if the server fails or the network connection is broken) before image files are purged.

The image files are called orphans because RightFax has no record of their existence and cannot access them.

One event triggers the orphan scanning process.

To delete orphan image files from the RightFax Server use the **Orphan.exe** utility.

RECOVERY

Prior to RightFax 9.3, the RightFax Server module stored fax events in memory. When the server module stopped, events were lost, and the event queue was rebuilt when the server module was restarted.

The RightFax event queue is now stored in the RightFax database on the SQL Server, and it is shared among RightFax Servers. The queue is persistent. That is, it retains its objects and values if the RightFax Server module stops. If one of the RightFax Server modules in the shared configuration stops, then it is not necessary to rebuild the queue.

With RightFax 9.3, the recovery process is now performed daily on each RightFax Server to correct any discrepancies between the persistent event queue in the RightFax database with the documents stored in the database.

CONFIGURING MAINTENANCE

Each maintenance process is an event that is stored in the event queue on the SQL Server. One RightFax Server will perform maintenance when a maintenance event is queued, on a first-come, first-served basis.

Aging is performed before purging.

The default time for maintenance to begin is 2 a.m. The time is set in the RightFax Server Configuration dialog box, **Advanced** tab.

VIEWING THE MAINTENANCE LOGS

Logs of the maintenance process are stored in the RightFax\Database folder on the server that performed the process. The logs are:

- MaintAgingAndPurging.log
- MaintOrphanScan.log
- MaintDocRecovery.log

What is Not Supported?

SQL Server Express Edition is not supported with the shared services module for database sharing.

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.

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