# DocuWare

## White Paper on-premises version 7.11

Copyright © 2024 DocuWare GmbH - All rights reserved
The document contains proprietary DocuWare information. It is provided under a license agreement containing restrictions on use and disclosure and is also protected by copyright law. Due to continued product development this information may change without notice. The information and intellectual property contained herein is confidential between DocuWare GmbH and the client and remains the exclusive property of DocuWare. If you find any problems in the documentation, please report them to us in writing. DocuWare does not warranty that this document is error-free.
No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of DocuWare.
The content of this guide is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by DocuWare GmbH.
DocuWare GmbH assumes no responsibility or liability for any errors or inaccuracies that may appear in the informational content contained in this guide.
For the latest information, visit the DocuWare Knowledge Center.

# Table of Contents

**White Paper on-premises 7.11**



Copyright © 2024_10 - DocuWare GmbH - All rights reserved

# Databases, storage locations and fulltext index

DocuWare requires several databases and at least one file storage (file cabinet). Installing the fulltext functionality is optional.

## Databases

For its operation, DocuWare requires several relational databases. These databases are used for storing the structured index data of the documents, for searching them and for the full-text index. In addition, DocuWare stores all essential system information (such as Authentication Server data) in a database or saves workflow information there.
Note: The database user that DocuWare uses to access its databases must have owner-level permissions for all databases. Permissions such as reader, writer or administrator are not sufficient.

### Supported database systems

MS SQL Server and MySQL Server can be coupled with a DocuWare system. The administrator has the option of specifying a particular database to be used for each file cabinet. In addition, a cluster system can be connected. Databases may reside on autonomous servers outside the DocuWare server area. DocuWare can work with several database connections to different servers and different databases simultaneously. Several simultaneous connections can be established to one database. To ensure optimum performance and maintainability, DocuWare recommends using the Microsoft SQL Server database system for archives with more than 1 million documents (without full-text functionality) or more than 200,000 document pages (with full-text functionality). Contact DocuWare Professional Services for support in the migration of databases.

### Internal database server

In the event that no external database server is provided or can be set up, DocuWare also offers an integrated database server as part of the standard feature set (Internal Database). This MySQL server can be optionally installed with the Server Setup.
If an MSSQL database is used, the archive name can be up to 128 characters long, and with MySQL up to 64.

### Structure of the databases

A DocuWare system contains the following databases:

- System database (DWSYSTEM)
  All data on rights, licenses, and settings are stored in this database. Auditing data at system and organization level can also be found here.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

- Database for document data (DWDATA)
  This database contains all internal system information for searching and finding documents. You can create several such databases.
- Notification database (DWNOTIFICATION)
  This database contains all the events that the Background Process Service needs to run workflows and email notifications.
- Workflow Engine database (DWWORKFLOWENGINE)
  This database contains all information required by the Background Process Service for creating, editing, and executing workflow configurations.

## Storage locations

DocuWare supports a broad spectrum of storage media for storing documents. This includes local hard disks, (virtual) network storage media, and external storage systems. Which media actually come into use depends on the volume of the documents to be stored and requirements concerning access and safeguarding. As long as conventions for Windows file systems are complied with, the technological basis of these systems is irrelevant. You can also use storage procedures such as RAID systems (RAID = Redundant Array of Independent Disks) or NetApp storage solutions, provided that these can be incorporated into the Windows file system as a virtual system drive.
DocuWare also supports special storage systems. DocuWare delivers software that can be used to incorporate storage systems as DocuWare file deposits in the same way as in a file cabinet, as is possible with Windows file deposits. You can set specific options to determine whether files will be written directly to the target medium, which in the case of WORM for example will ensure maximum security, or whether to go via the intermediary of the virtual disk.

### Hard disks, RAID

In addition to the ability to use individual hard disks, you have the option of combining several hard disks in a "Disk Array." These arrays are the ideal solution for an archiving system where magnetic storage technology does not present a problem. If a RAID is selected, it increases security against loss of data in the event of hard disk failure thanks to redundancy. This way you can swap a hard disk – depending on the RAID level – during running operation.
Directories and drives can be used as document storage. It is irrelevant whether the directories and drives are simple hard disks, virtual disks, RAID networks (hardware or software RAID, storage spaces) or network drives.
For production systems, it is recommended to store the data on redundant storage systems. The use of simple, non-redundant storage systems is not recommended.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

If DocuWare is installed distributed over several servers, network storage should be used and SMBv3 should be used as the protocol. SMBv1 should not be used for security reasons.
For installations with a high volume and many users, the database files should be stored on redundant flash memory. The same applies to the full text index files. The storage locations for the documents can be distributed on classic disks even in large installations.
Platform Service and Background Process Service must have read and write access to all storage locations and databases used by DocuWare:

- All accesses to the memory take place under the Windows account that was entered in the Server Setup for the service user. In addition, this user must have full access to the memory to support the full functionality of the product.
  The app pools of the Frontend Services (like Platform) access the storage for interactive requests, for example for storing a new document or repeating Intelligent Indexing interactively.
  The Windows service of the Backend Services (like Background Process Service) accesses the storage for queued background tasks, like extracting document text and sending documents to Intelligent Indexing in the normal case.
- It does not matter which DocuWare user is served by the services. Access is always done in the context of the service user, both in the Frontend (app pool) as well as in Backend Services (Windows service).

### NetApp storage

The NetApp storage solutions are based on NetApp's own operating system and can be integrated in various storage area networks similarly to hard disks (NAS, SAN, iSCSI). They are especially intended to manage large volumes of data and for the long-term archiving of WORM documents. NetApp Storage can be used with DocuWare for storing documents. Files in NetApp storages cannot be edited and are assigned the "Read Only" attribute. Even if disks on NetApp storage solutions can be set to different types in the DocuWare Administration, we recommended to select the type "WORM" because it is best suited for the NetApp behavior.

## Fulltext index

During a fulltext search, the Fulltext Server lists the occurrences as well as the context strings for the individual search terms in a fulltext index. At the same time, the estimated relevance of a term is evaluated. The result list of a fulltext search is sorted according to this relevance. The optional Fulltext Server is based on the SolR 9 platform. For more information, see the Fulltext Functionality section in the chapter file cabinet structure.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

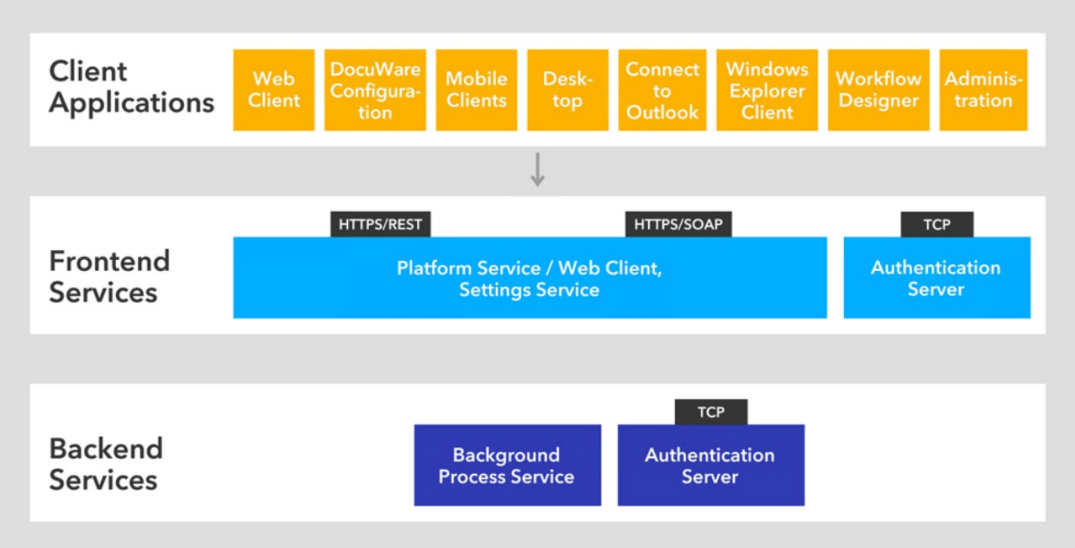
# Communication technologies

The following sections tell you about the protocols used in a DocuWare system and which individual components exchange information about which standards.

## Protocols

DocuWare uses the following TCP-based protocols for communication among the individual software components.

- **HTTPS (transmission of HTML or binary data)**
  HTTP is unencrypted by default. To communicate securely over the internet, you must encrypt it with TLS/SSL (HTTPS). To do so, a certificate on the server with the IIS (Internet Information Services) is required.
- **HTTPS with REST (Representational State Transfer)**
  In particular, the DocuWare Platform Service is fully REST-based.
- **HTTPS with SOAP (Simple Object Access Protocol)**
  SOAP is for sharing messages based on the XML Information Set. In the DocuWare System, SOAP is used by various Frontend Services for communication with client applications.




*Communication between the layers of client applications, Frontend Services, and Backend Services*

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

## Client-server communication

The matrix shows you which server communicates with which client applications. The protocols used are indicated in brackets, and the ports used are indicated in a separate line. Standard ports are used for all client applications. The only exception is DocuWare Administration.

| | SERVER | | | |
|---|---|---|---|---|
| CLIENT APPLICATIONS | Local Desktop Service (HTTPS) 8090/8091 | Platform Service / Web Client (HTTPS) 80/443 | Settings Service / DocuWare Configuration (HTTPS) 80/443 | Authentication Server (TCP) 9000 |
| Web Client | X | X | | |
| DocuWare Configuration | X | X | X | |
| Scan | | | X | |
| Import | | | X | |
| Export | | X | X | |
| Printer | | | X | |
| Smart Connect | | X | X | |
| Edit & Send | | X | | |
| Desktop Service | | X | X | |
| Connect to Outlook | | X | X | |
| Windows Explorer Client | | X | | |
| Workflow Designer | | X | X | |
| DocuWare Administration | | | | X |
| Index Cleaner | | X | | |
| Mobile Client | | X | | |
| PaperScan Client | | X | | |

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

## Server-server communication

In the matrix you can see which servers communicate with each other through which protocols, and which databases they access. If you use several server machines for the Frontend Services and Backend Services, please make sure that all necessary communication ports are available for other server machines.

| | SERVER | | | | | | DATABASES | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SERVER | 8090/8091 Local Desktop Service (HTTPS) | 80/443 Platform Service / Web Client (HTTPS) | 80/443 Settings Service / DocuWare Configuration (HTTPS) | 9000 Authentication Server (TCP) | 9012 Fulltext Server (HTTP) | 443 Intelligent Indexing (HTTPS) | DWDATA | DWSYSTEM | DWNOTIFICATION | DWWORKFLOWENGINE |
| Platform Service / Web Client | | | | X | X | X | X | X | X | X |
| Settings Service | | | | X | X | X | X | X | X | |
| Identity Service | | X | X | X | | | X | X | | |
| Authentication Server | | | | | | | X | X | | |
| Notification Server | | | | X | | | | X | X | |
| Connect to DATEV | | X | | | | | | | | |
| Connect to SAP | | X | | X | | | | X | | |
| Background Process Service | | X | X | | X | X | X | X | X | X |
| Client Setup/DocuWare Update | | X | | | | | | | | |
| External DocuWare system via synchronization (synchronization version 2) | | X | | | | | | | | |

## Message bus

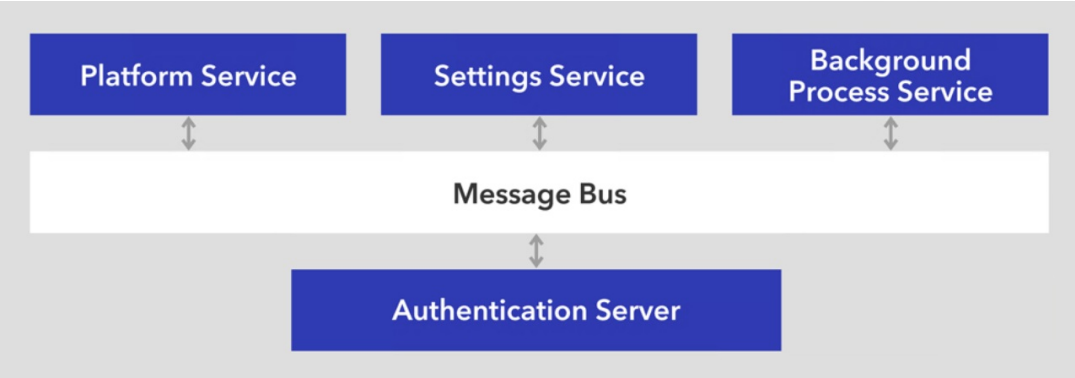
The message bus is the central platform for exchanging messages between the Web Servers and most backend servers. It uses the Microsoft Message Queuing (MSMQ) protocol. The message bus is responsible for sharing changes between server components.

The Message Bus follows the publish-subscribe pattern. It implements a fire-and-forget pattern that, for reasons of speed, requires the message to be delivered directly or it will be lost. One typical application would be notification about newly arrived documents or modified settings.

The messages are always sent to all subscribers. The subscribers decide whether they want to reuse the messages or not.

The Message Bus is managed in the management console on the "Message Queuing" node and can be installed multiple times in one DocuWare system.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved




*The Message Bus is used for communication between the Frontend Services and a part of the Backend Services.*

The DocuWare setup installs the Windows functions "Microsoft Message Queue" and "Multicast support". Multicast is not supported by all virtualized networks but it is required for DocuWare Multi-server installations because messages need to be exchanged between servers. Multicast support is not required for installations on a single server.

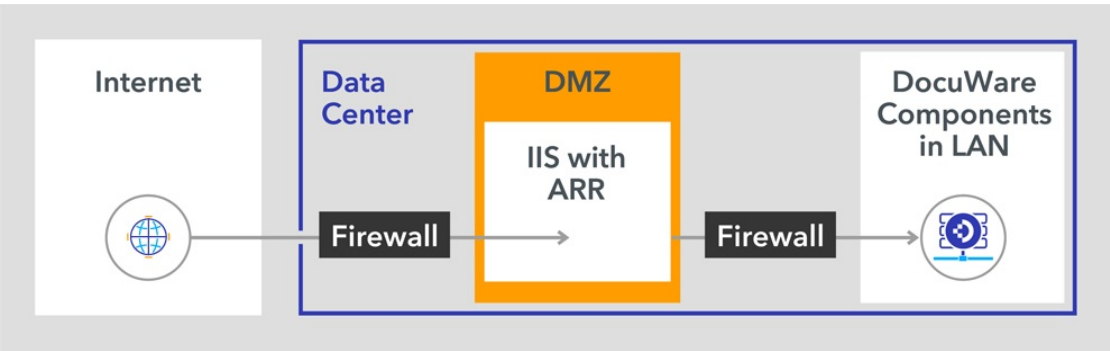
Copyright © 2024_10 - DocuWare GmbH - All rights reserved

# Security and external access

To access your DocuWare system externally, for example via the Internet, you should note of the following points. This also applies if you want to use public forms with DocuWare Forms.

- **Required ports:** If you set up external access to your DocuWare system, only the ports of the Web Client (by default port 80 or 443) need to be approved in the firewall of your DocuWare system. More information about ports can also be found in the "Server-Server Communication" matrix in the "Communication Technologies" chapter.
- **HTTPS (TLS/SSL)**: The DocuWare Web Client and the DocuWare Desktop Apps support all current HTTPS. To configure the DocuWare Web components for HTTPS (TLS/SSL), you must carry out the following steps in IIS manager:
  - Import the certificate or certificates ("server certificate", "Import" action)
  - Adapt the website link and make it accessible via TLS
  - Remove the HTTP link for security reasons

  If you use a self-signed certificate, you must also ensure that your certification center is defined as a trusted certification center on all clients. To do so, import the certificate into the certificate store of all computer and user accounts in your domain, for example using a Group Policy Object (GPO) from Microsoft.
- **Split DNS**: To be able to use the Identity Service of DocuWare, you must have set up Split DNS. This is the only way to resolve the host name to an IP address in the internal network and another IP address in the external network and to avoid certificate error messages.
- **Demilitarized Zone (DMZ):** The DocuWare Web components connect directly with the database. It is therefore not recommended to install the DocuWare Platform Service in a DMZ, for example. All components, including the Web components, should only be installed within the LAN. The Web Server in the DMZ should route requests accordingly to the internal Web Server, for example, using Application Request Routing (ARR). More information about ARR can be found in the Load Balancing section of the DocuWare Server Setup.




Copyright © 2024_10 - DocuWare GmbH - All rights reserved

- **Protecting sensitive data outside of DocuWare**: Some of the data of DocuWare is unshielded and cannot be protected by specific DocuWare security mechanisms. This include the index data of the documents and the extracted full text, which are stored in their respective databases. Every system administrator with sufficient privileges to view the database can access these data. Fulltext is also stored in a separate index that is controlled by the fulltext server. The fulltext server is based on Apache SolR, a widely used fulltext engine.
  If these data repositories contain sensitive data, then access to the databases, to the index location, and the access to the full text server URL - by default http://machinename:9012/solrt need to be restricted by the administrator using common methods such as access control lists for file directories or databases as well as a transparent Encrypted File System (EFS) for the fulltext user.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

# Setup

The setup of the multiple DocuWare components is split into Server Setup and Client Setup. In addition to the Client Setup, DocuWare Update is available to update client applications.

## Server setup

With the server setup, you install, update, and uninstall all frontend services and backend services.
The Connect to SAP server is not installed through DocuWare setup, but made available by DocuWare Professional Services as a separate application.
DocuWare Administration can be installed with both the server setup and the client setup. To install the administrative Power Tools as client applications, you use the server setup.
The server setup creates the databases and updates them during an upgrade. It also creates configuration files for individual components and a machine-wide configuration file (storage location: %programdata%/docuware/serverconfig/dwmachine.config).

## Client setup and DocuWare Update

Use the **Client Setup** to install, update, and uninstall all applications required on the client side. The applications in the Client Setup are not available via the DocuWare Setup except for DocuWare Administration.
The Client Setup uses Windows Installer. The client components can be installed via Client Setup.
**DocuWare Update** automatically checks whether updates or hotfixes are available for the applications installed on a client and reports the result to the user. If required, the client setup opens so the user can install updated versions. In the update, the version numbers are compared with the locally installed version numbers.
Find more information about the Command-line interface for software distribution (Desktop Apps Silent Installation/Upgrade) in the DocuWare Support Knowledge Base.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

# Scalability

The DocuWare system is highly scalable and can be tailored to meet a wide range of requirements. For smaller application scenarios, DocuWare can be installed as a standalone system with all servers, databases and storage locations on a single computer. In contrast, for very complex application scenarios, the entire system can be duplicated except for certain areas.
The following factors play a role in determining which form the DocuWare system should be scaled in:

- Number of simultaneously active users
- Availability requirements
- Number of business processes covered by DocuWare and of document types
- Number of "living documents", i.e. documents that are simultaneously used in workflows

The extent to which the DocuWare system scaling and load balancing measures described in this chapter can be realized depends on the server edition bought.

## Scaling forms of the system

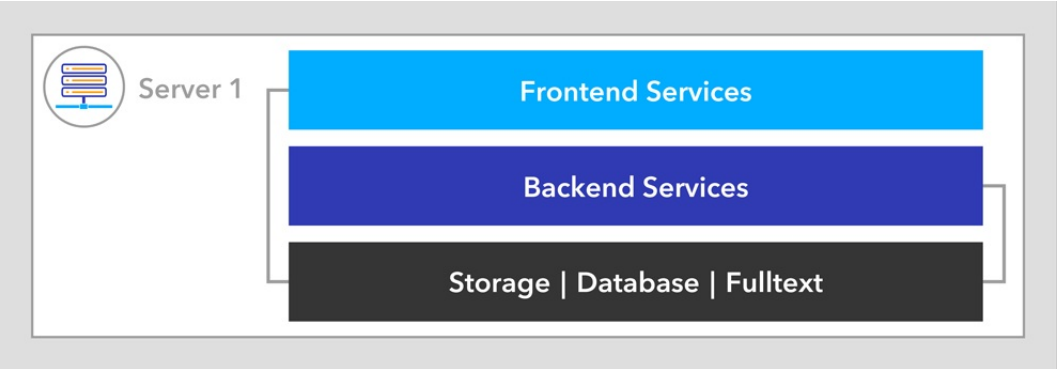
There are five basic scaling forms. When installing your DocuWare system, it is best to use one of these forms as a guide. Depending on requirements and licenses bought, there may be differences in each individual installation.
Depending on the extent of use, we recommend one of the following five scaling forms (XS-XL):

| | XS | S | M | L | XL |
|---|---|---|---|---|---|
| **Users active at the same time: up to 50** | X | X | | | |
| **Users active at the same time: up to 250** | | X | X | | |
| **Users active at the same time: up to 500** | | | X | X | |
| **Users active at the same time: up to 1000** | | | | X | X |
| **Users active at the same time: more than 1000** | | | | | X |
| **Fail Safety** | | | X | X | X |

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

## Scaling form XS: 1 server

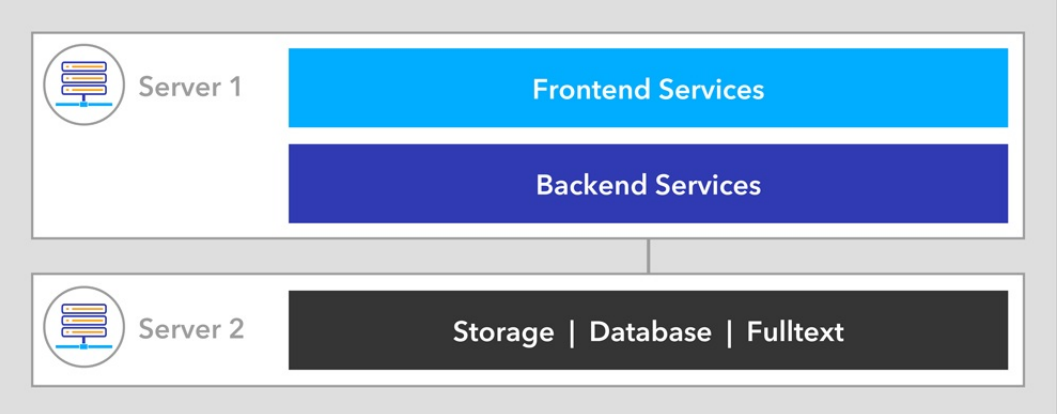
In this simplest form of scaling, the entire DocuWare system is installed on one server with the frontend services, backend services, databases, and storage locations, as well as the fulltext functionality.
You need one server license (Business, Professional or Enterprise).




*DocuWare system on a server*

## Scaling form S: 2 servers

In this scaling form, the DocuWare system is installed on two different servers. The frontend services and backend services are installed on one server, while the databases, storage locations, and fulltext functionality are installed on the other one.
You need a server license (Business, Professional or Enterprise).



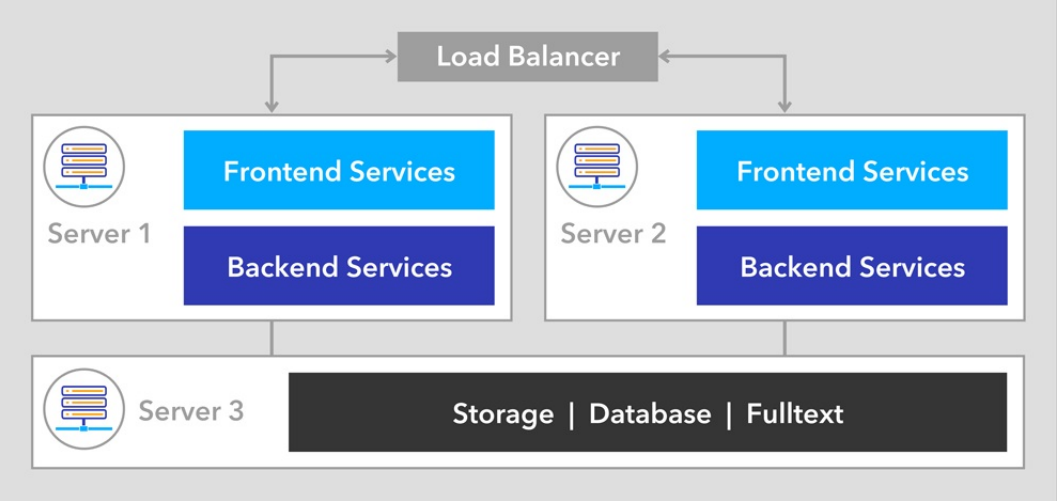

*DocuWare systems on two servers: Databases, fulltext functionality, and storage locations are outsourced*

## Scaling form M: 3 servers

With this scaling form, the frontend services and the backend services are each installed once on Server 1 and Server 2. Servers 1 and 2 can therefore be accessed in the same way.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

Databases, storage locations, and the full text functionality are installed on Server 3. A load balancer is connected upstream of the complete DocuWare system. DocuWare recommends for load balancing the variant Layer 7 with Web server and Application Request Routing (ARR). To ensure that Servers 1-3 work independently of each other and can also be restarted, all Authentication Servers work in "Local Mode." There is no further machine-to-machine communication.
More information about Load Balancing in DocuWare
For this scaling form you need either an ENTERPRISE server license or two PROFESSIONAL server licenses.

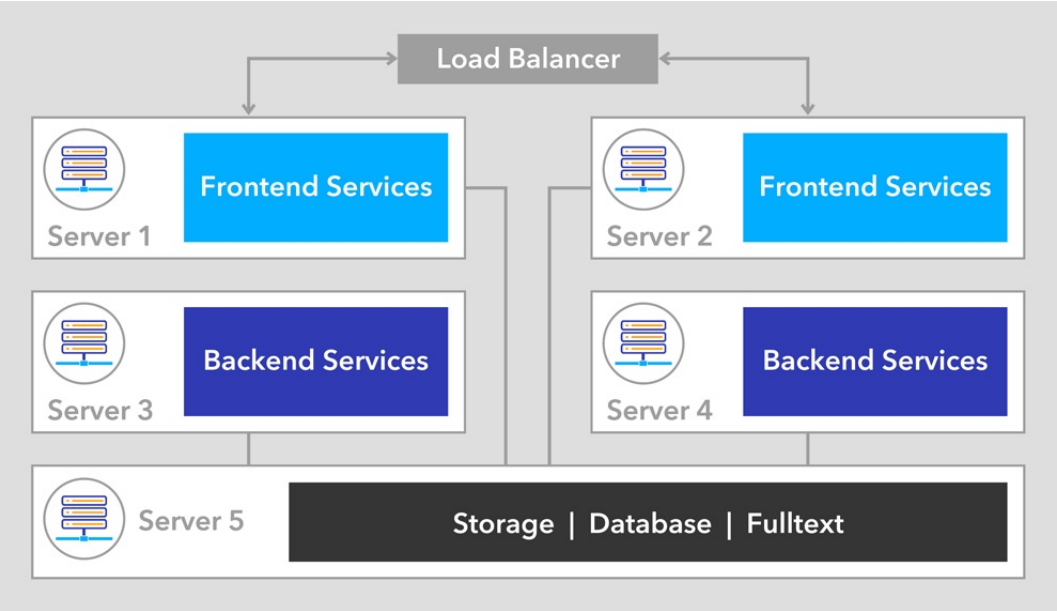



*This scaling form requires three servers and a load balancer*

## Scaling Form L: 5 servers

With this scaling form, the frontend services are installed once each on Server 1 and Server 2, and the backend services are installed once each on Server 3 and Server 4. Server 1 to Server 4 can therefore be accessed in the same way. Databases, storage locations, and the full text functionality are installed on Server 5.
A load balancer is connected upstream of the complete DocuWare system. DocuWare recommends for load balancing the variant Layer 7 with Web server and Application Request Routing (ARR). To ensure that Servers 1-5 work independently of each other and can also be restarted, all Authentication Servers work in "Local Mode." There is no further machine-to-machine communication.
For this scaling form you need either an ENTERPRISE server license or two PROFESSIONAL server licenses.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved

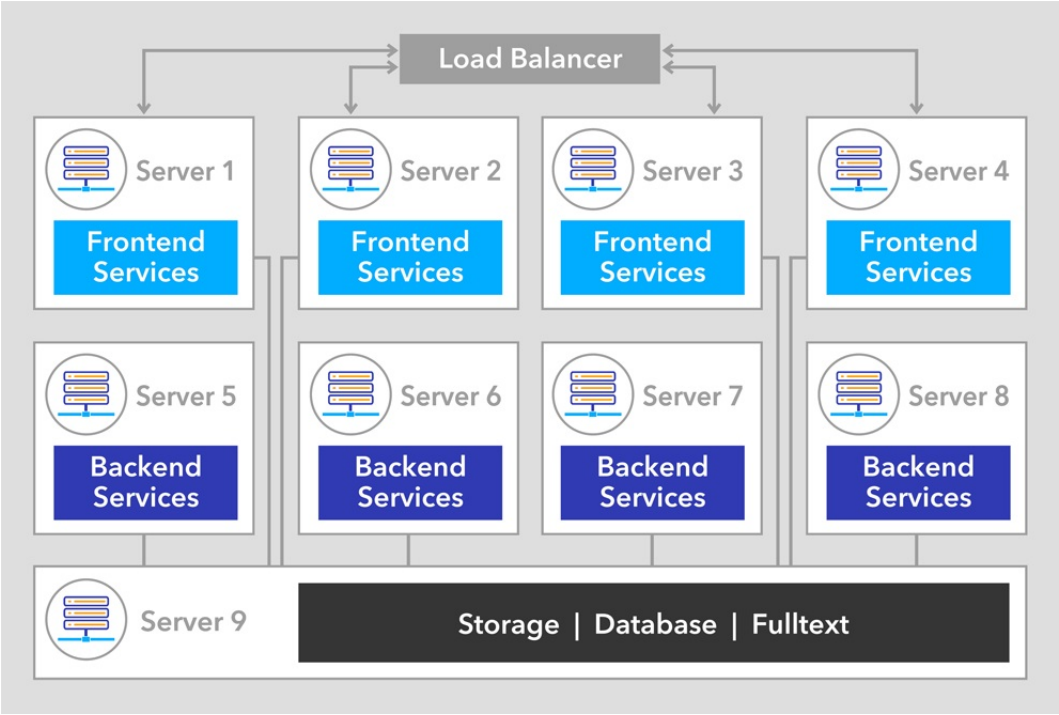



*This scaling form requires five servers and a load balancer*

## Scaling Form XL: 9 servers

With this scaling form, the frontend services are installed once on each of four servers (1-4). On four additional servers (5-8) the backend services are installed once each. Servers 1 to 8 can therefore be accessed in the same way. Databases, storage locations, and the full text functionality are installed on Server 9.
A load balancer is connected upstream of the complete DocuWare system. DocuWare recommends for load balancing the variant Layer 7 with Web server and Application Request Routing (ARR). To ensure that Servers 1-8 work independently of each other and can also be restarted, all Authentication Servers work in "Local Mode." There is no further machine-to-machine communication.
For this scaling form you need either two ENTERPRISE server licenses or four PROFESSIONAL server licenses.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved




*This scaling form requires nine servers and a load balancer*

Once you have installed your DocuWare system based on one of the five recommended scaling formats, it may make sense to take further individual scaling measures in certain cases where there is a heavy load. However, you should always pay attention to the root cause of the load: Two different scenarios are described below.

- Scenario 1: Many DocuWare users are accessing the system at the same time, e.g. conducting searches or processing tasks.
  In this case, you need a scaling form with more frontend services and you should increase the number of machines.
- Scenario 2: Many predefined or some very extensive workflows run simultaneously, or many documents that need to go through the fulltext are being filed at the same time. This may apply to a system migration, for example.

In this case, you need more backend services and the workflow server should be installed multiple times. The workflows must be explicitly assigned to different Workflow Servers in order to distribute the load. (These are workflows specified in DocuWare Administration, not workflows from the Workflow Manager module.)
See also the notes on fail-safety.

## Data management

Databases, fulltext functionality and storage should be scaled by measures recommended by the particular producer. For selecting the database server see section Supported Database Systems.
See also the notes on fail-safety.

Copyright © 2024_10 - DocuWare GmbH - All rights reserved