

# White Paper System Architecture

DocuWare Version 7.7

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# 1 Introduction

## 1.1 Objectives of this White Paper

This White Paper explains the architecture of DocuWare as a locally installable software (on-premises system). You will find out which components and technologies DocuWare uses and how they interact. The document is aimed at readers with an interest in technology, particularly technical staff at clients, sales partners, and consulting firms, as well as specialist media. It shall enable you to form a technologically well-founded opinion about DocuWare as a locally installed system and to assess its capability in terms of flexibility, scalability and performance when handling current requirements.

If you would like to know more about other technical aspects of DocuWare, go to the DocuWare Knowledge Center to find additional White Papers on [Integration](#), [Security](#), [Intelligent Indexing](#), [Electronic Signatures](#) and [DocuWare Cloud](#).

## 1.2 Document management and workflow automation with DocuWare

DocuWare is a modern document management system for professional enterprise content management and workflow automation. DocuWare lets you access and process your documents and the important information they contain anytime, anyplace. The DocuWare system architecture stands out due to full multi-client capability, its service-oriented structure and cutting-edge technology for web and mobile applications.

DocuWare is based on the normal workplace environment and familiar working procedures. Documents such as invoices, delivery notes or contracts can be indexed, archived and thus made available and processed for all purposes in a fully automated manner. They are first gathered in electronic document trays, a little like the in-tray on your desk. Then you can edit the documents as usual – you sort them, clip them together if necessary, and add notes, comments, signatures, or stamps.

Finally, the documents are always stored in digital archives, the file cabinets. These file cabinets form what is known as the document pool. It is up to you how many file cabinets to create and how they are organized – you decide what makes sense for your company. Using the highly efficient index functions, all types of documents are always filed in the right place and displayed on screen with a few clicks.

Thanks to its automation and integration capabilities, you always have all documents at hand and easily use their data in your workflows and with all kinds of [integrations](#). The [DocuWare Knowledge Center](#) tells you all about the different applications.

DocuWare for an on-premises installation is sold according to a licensing model that offers a basic solution and add-on solutions. Function bundles can be bought later as licensed modules.

## 1.3 Fit for the future thanks to cutting-edge technology and integration capability

DocuWare uses the latest technologies in programming and designing its system architecture. As a modern enterprise content management system, DocuWare is always one step ahead of the present to meet the varied user requirements of tomorrow. Therefore, you can smoothly integrate it with all kinds of business applications, such as your accounting system. Integration with DocuWare is done via simplified, wizard-guided configuration. You can also benefit from the special DocuWare connectors or integrate customized programming.

DocuWare works on a browser, to use its Web client, you just need an internet-capable device with a browser. Therefore you can use DocuWare across all platforms: The system can be called up on Windows, Mac OS and Linux devices. Only in a few cases are local Windows applications needed; these are brought together in DocuWare Desktop Apps, which can easily be managed centrally.

The DocuWare Web Client is based on HTML5 technology and thus supports all standard browsers, even for highly complex operating scenarios.

DocuWare works with open communication standards and uses HTTPS between the components, mostly either based on the REST (Representational State Transfer) or SOAP (Simple Object Access Protocol) technology.

The mobile applications of DocuWare are available in iOS and Android, and thus on all key platforms. To install DocuWare, the latest Windows versions are always supported and for the databases, all key server technology in a large number of versions, namely MS SQL, MySQL, and Oracle.

DocuWare Cloud and DocuWare as an on-premises solution are based on the same code, so both solutions offer an almost identical range of functions. On-premises customers also benefit from technological enhancements for DocuWare Cloud, for example in performance, stability and scalability.

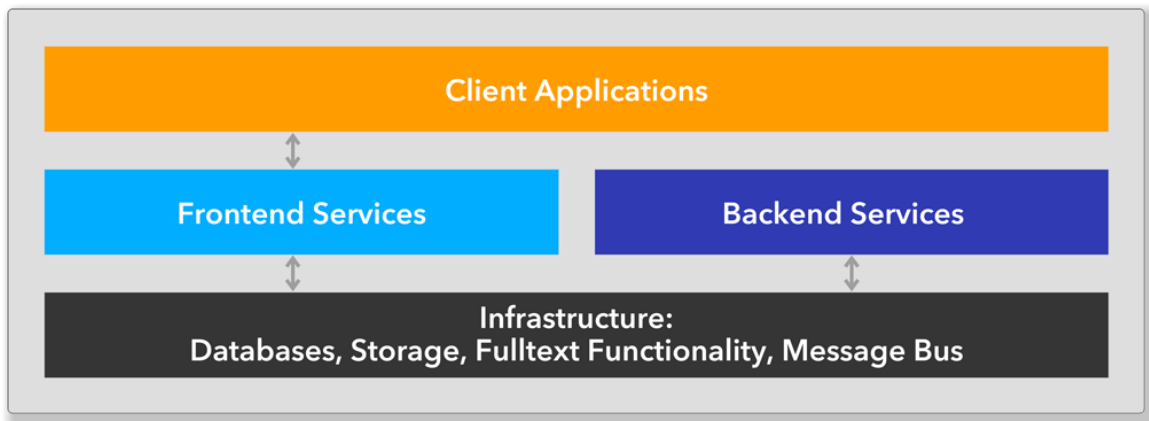
## 1.4 Three-tier architecture

The DocuWare Server architecture is divided into three tiers:

1. Frontend services  
A part of the application logic is found in several services of the frontend role.
2. Backend services  
Another part of the application logic is found in several services of the backend role.
3. Infrastructure (storage locations, databases, fulltext functionality, message bus)  
In principle, several servers share common resources on one or more central background servers.

The frontend and backend roles are installed with DocuWare setup.

The three layers of the DocuWare system architecture communicate with the client applications via the frontend services. All dialog-oriented functions run in the browsers of the workstation systems and mobile devices used in the client applications.



The term server here refers to a software service, not to a piece of hardware. A DocuWare system therefore invariably consists of several (software) servers, all of which can – as a minimal solution – simultaneously run on one hardware system.

## 1.5 System requirements

DocuWare relies on sustainable technologies and the greatest possible compatibility between the system and a wide range of different hardware and software components from other manufacturers. System requirements are therefore adapted with each new version. This section gives you an initial overview. For the most recent details, also regarding possible limitations, see "[System Requirements](#)" in the DocuWare Knowledge Center.

### Web Client

DocuWare supports the latest versions of Firefox, Chrome and Edge Chromium browsers.

### DocuWare servers

The servers of the DocuWare system are implemented on the basis of Microsoft's .NET architecture. They can therefore be run on all platforms that support a common version of Windows.

### Infrastructure components

For databases, DocuWare supports the latest versions of Microsoft SQL Server, Oracle, and MySQL.

### Terminal Server

The Microsoft Terminal Server and Citrix Metaframe can be used as extensions of the DocuWare system. However, the DocuWare Desktop Apps are not intended for use on a terminal server by default. In order to be able to use the Desktop Apps remotely on a terminal server, you have to make manual settings for each terminal server. You can find more information [here](#).

Use of the DocuWare Desktop Apps as remote apps is not supported.

## 1.6 Using client licenses

DocuWare offers two types of client licenses: named client licenses and concurrent licenses.

New or newly enabled users automatically receive a free named client license. This is independent of how the user account was created – whether manually, via the platform API, via user synchronization or otherwise. If the user is deleted or disabled, the named client license can be assigned to other users again.

If you use both named client licenses converted from concurrent licenses and directly purchased named client licenses, the named client licenses converted from the concurrent licenses are used first.

A client license – regardless of whether it is named or concurrent – lets you use an instance of Platform, Web Client, Connect to Outlook, Windows Explorer Client, and Mobile at the same time. The following overview shows which DocuWare modules use these five components:

DocuWare Module	Platform	Web Client*	Connect to Outlook	Windows Explorer Client	Mobile
Web Client, Forms, URL Integration, Smart Search, Quick Search for Connect to Outlook		X			
Connect to Outlook			X		
Windows Explorer Client				X	
Mobile					X
PaperScan (for access to DocuWare)					X
SDK	X				
Connect to DATEV	X				
Connect to SAP Version 2	X				

\* Per browser on one device. In terms of the license requirement, whether a tab within a browser is classified as a separate browser varies depending on the browser.

**The following applications do not require any client license:**

- Desktop Apps (Printer, Import, Scan)
- DocuWare Administration



- DocuWare Configuration (provided it is not opened via the Web Client, but directly, e.g. via the right mouse menu belonging to the DocuWare Desktop Apps in the Windows taskbar)
- Workflow Designer
- Web Client ReadOnly
- Additional function "Public form" (web forms in general, however, require client licenses)

### Examples for the client licenses requirement

1. Parallel work with Web Client, DocuWare Configuration, DocuWare Administration, Connect to Outlook, and DocuWare Mobile => 1 client license
2. Web Client used in parallel in two different browsers => 2 client licenses
3. Web Client used in parallel with Windows Explorer Client on one device => 1 client license
4. Web Client used in parallel with Windows Explorer Client on two devices => 2 client licenses
5. DocuWare Configuration used in parallel in two browsers => 0 client licenses (provided it is not opened via the Web Client, but directly, see above)
6. Web Client with the same user used in parallel for a public form => 1 client license
7. Mobile used in parallel on two different devices => 2 client licenses

Once a user has logged off, the client license will remain open for a further two minutes. If the user closes the Web Client or the Platform just by closing the browser, but does not explicitly log off, the license will also stay open for two minutes. Only if the browser is closed unexpectedly will the license stay open for longer periods of time in certain circumstances.

## 1.7 Using server licenses

For all servers there is a single license with the name "DocuWare Server."

- In the organization area of DocuWare Administration > General > Licenses you can only see the total number of server licenses you have purchased:
  - 1x Business: 1 server
  - 1x Professional: 1 server
  - 2x Professional: 2 servers
  - 1x Enterprise: 2 servers
  - 2x Enterprise: 4 servers
- You may install each DocuWare server role once for each server license (frontend services, backend services, fulltext service).
  - 1x Business: 1x frontend services, 1x backend services, 1x fulltext services
  - 1x Professional: 1x frontend services, 1x backend services, 1x fulltext services
  - 2x Professional: 2x frontend services, 2x backend services, 2x fulltext services
  - 1x Enterprise: 2x frontend services, 2x backend services, 2x fulltext services
  - 2x Enterprise: 4x frontend services, 4x backend services, 4x fulltext services

## 2 Client applications

The DocuWare system comprises three types of client applications:

- Web-based applications
- Windows-based applications
- Applications for mobile end devices

The following sections provide information about components in these various areas.

### 2.1 Web-based applications

The web-based applications include DocuWare Web Client and DocuWare Configuration. The following sections provide information about their system components.

#### Web Client

The Web Client is at the heart of DocuWare's client applications from a user's point of view. It allows you to access the DocuWare system online without having to install a client application.

The Web Client offers all the possibilities of modern document management and workflow automation. You can store and search the documents in a file cabinet (among other places) and display and edit them in the DocuWare viewer. You can also perform many of the same actions as with paper storage, such as combining several documents into a single file. Furthermore, you can handle all your document-based processes in automated workflows, for example your invoice approval process.

The feature set of the Web Client has more functions – such as the workflow task list or the Task Manager – depending on the modules, which can be licensed in addition to the standard DocuWare features.

The Web Client is based on HTML5 technology. The component is integrated in the [Platform Service](#) (page 20), which it uses to communicate with backend servers.

The Web Client uses the Desktop Service to communicate with the components of the DocuWare Desktop Apps.

#### Configuration

DocuWare Configuration consolidates the configuration interfaces of the applications, also called modules, within a DocuWare system. The applications are usually based on HTML5, with only a few components still based on Silverlight technology.

The DocuWare Configuration technically consists of two components: the user interface with the application components and the [Settings Service](#) (page 21) for saving the settings.

In each configuration module, you can

- create, edit and delete configurations
- assign permissions for the configurations to other users

In order for a configuration module to be displayed to you in the DocuWare Configuration, you need the corresponding functional right to use it. A list of the available configuration modules with the respective required function rights can be found [here](#).

**Organization Settings:** Here you manage global settings for your system. You can make general settings for diagnostics and feedback, as well as for time and language. Furthermore, you define security settings for login, passwords, single sign-on (SSO) and the restriction of file types.

**User Management:** With this component you manage all users and rights within your DocuWare organization, including the functions:

- Create users and equip them with rights, dialogs, and stamps
- Modify user rights
- Unblock users blocked by failed login attempts
- Change password for users or send corresponding email to users
- Delete users

**Audit Reports:** With this component, you log the events within your file cabinet. Examples of events that are logged for a document at the individual levels, each with date, time and user, are: Store, index change with old and new value, display, print, send by email, annotate, etc.

All audit reports can be downloaded in CSV format and used for evaluations in other applications.

**Mail Services:** For your email services, you can set up connections to IMAP and Exchange servers here.

**Text and Barcode Recognition:** Here you configure the recognition of text (OCR) and of barcodes (OBR) with the settings for speed, accuracy, languages, barcode types and permissions.

**Preconfigured Solutions:** Here you can import preconfigured solutions into an existing system or export the configuration of the current DocuWare system. This is done using a DWBUC file that contains most of the configuration elements, such as file cabinets, forms, deletion rules, email notifications or workflows.

**Document Processing:** Here you define how your documents are processed in DocuWare. This can be set up for different sources: scanner, folder and DocuWare Printer.

In a processing configuration, you set the target file cabinet for the documents, make settings for indexing, and define details such as adding a metadata file or electronic signature. To store documents in a file cabinet, you need at least one processing configuration. Without a processing configuration, you can only store documents in your default basket, but not in a file cabinet. In order to execute such a configuration, you need the appropriate DocuWare Desktop Apps.

In addition, you can import files with XML metadata in the formats described here.

Note: If you have set up several connections while working in the Document Processing configuration area, the active connection changes to the system currently in use under certain conditions. For example, a user has two connections in the Desktop Apps: one for system X and another for system Y. The connection for system X is the active one. If the user logs on to system Y and opens document processing, the connection automatically

changes to system Y as soon as he opens an existing or new configuration that contains an example document.

**Forms:** Here you set up Web Forms with the settings, among others: select and assemble form elements; submission details; store as form or template; select store dialog; indexing; permissions. You can integrate Web Forms into the document workflow with DocuWare.

**Connect to Outlook:** Here you set up storing configurations for email handling in the connection of Microsoft Outlook with DocuWare. You can archive your emails from Outlook in DocuWare. Conversely, you can access your archived emails in Outlook.

The following settings, among others, are available to you: specify archiving type, enable automatic invoice detection, use information from XML invoices in email attachment for indexing, define storage destination, assign permissions.

You can also set the criteria for quick searches. With a quick search you perform a search in DocuWare from a selected email.

**General Email:** Here you define the rules according to which emails from a webmail account are automatically imported into DocuWare. The following settings, among others, are available: define storage destination, assign permissions, link email accounts with storage configuration, determine mail server setting automatically.

**Indexing Assistance:** This is where you set up select lists and field masks.

- **Select lists:** Here you create fixed select lists, assign fields to them and import fixed select lists. Furthermore, you can create dynamic select lists and assign fields to them as well.
- **Field masks:** Here you add individual field masks to the fields from the File Cabinets area. At each position of the index word, the user can only enter those characters that are specified in the mask definition.

**Intelligent Indexing:** Here you configure DocuWare's Intelligent Indexing service. Intelligent Indexing classifies documents and automatically searches for relevant index terms.

The component is based on HTML5 technology.

**Autoindex:** This component is used to synchronize and complete index data. You automatically add external data as index data in DocuWare or pass index data from DocuWare to third-party applications.

DocuWare can also use metadata and search words from an external data source to archive documents. Autoindex transfers this data and adds it to the file cabinet as index entries. The external data source can be a DocuWare file cabinet, a database (table, view or SQL command) or a file. Autoindex matches the external data with the documents in the DocuWare file cabinet so that related documents are displayed. A match code is used to match records from the file cabinet and the external data source.

Autoindex jobs can be started in different ways: manually, according to a schedule, when a new document is stored or a previously stored document is changed, or using an indexing file (e.g. CRM). Contents of database connections can be additionally filtered by SQL.

**File Cabinets:** Here you set up archives. Basic archive components such as the fields are predefined and can be assembled into store and search dialogs as well as lists or result lists according to the modular principle. Access security is ensured by preconfigured standard profiles that are assigned to individual users and roles (e.g. read, edit, administration).

In addition, you can define database fields, search dialogs, store dialogs, result lists, lists, select lists for fields and folder structures, among other things.

**Document Relations:** With this component you make sure that all additional documents are listed that are related to a specific document. The links are available both in the result list and in the DocuWare Viewer.

**Deletion Policy:** DocuWare lets you delete selected documents after a specific time period – for example once the legally required retention period is up. Here you set up rules for deletion processes.

**Synchronization:** With this component you merge data from distributed DocuWare installations. The documents are mirrored or synchronized from a source to a target file cabinet. It is particularly well suited for data synchronization of local organizations and cloud organizations. In this synchronization, all file cabinets involved are equivalent.

You can find more information in the section [Export-Import-Synchronization](#) (page 41).

**Transfer:** With this component large volumes of documents can be moved or copied from one system to another file cabinet. The target file cabinet can be in another organization or DocuWare system.

As well as the index entries, the system entries for a document and the fulltext information are included in the transfer.

**Notifications:** Here you set up email notifications. A notification is an automatically generated email from the DocuWare system that is sent via an existing mail server as soon as a certain event occurs regarding a document archived in DocuWare. For example, a user can be informed by email about a pending task, such as invoice processing.

The following settings are available: specify archive, set triggers for events, define email properties, assign permissions and set up scheduling.

**Request:** Here you set up the export of documents as a Request file cabinet. The following settings, among others, are available: select documents, format, search options, set filters, prepare exported request archive for electronic signing, import documents from request archive into existing archive, schedule export, set storage destination, and assign permissions.

**Stamps:** Here you set up stamps. You can use a stamp to place information on a document without changing the content. Depending on the configuration, the stamp can modify or add index entries to pass documents through the process.

**Document Trays:** Here you set up document trays. This is the place where the documents that are waiting to be processed are located. These can be documents that are not yet stored or copies of documents that are already in the file cabinet.

There are, among others, the following settings: Determine connection to file cabinet, enable Intelligent Indexing and assign permissions.

**Smart Connect:** In this component you set up Smart Connect. This application reads content from the user interface of any application of your choice, and transfers this to DocuWare as a search or index entry. You determine, among other things, which content should be read from which applications and where the extracted content will be used in DocuWare: as search words in a search dialog including fulltext of a document (Smart Search, Highlight Search) or as index words in a store dialog or info box (Smart Index).

Smart Connect is part of DocuWare Desktop Apps and uses its connections.

**Export Data:** Here you configure the export of document index data to enable data transfer to third-party applications. This is particularly useful if DocuWare is integrated with ERP and accounting systems and the index data of the invoices is to be imported into these systems. The export takes place as a CSV file.

When structuring the data to be exported, all conventions that leading accounting systems provide for an import are covered.

Export is part of DocuWare Desktop Apps and uses its connections.

**Webservices:** Here you centrally manage all web services that you want to integrate into DocuWare. You can create web services of the types REST and SOAP. The stored web services are made available to you in selection lists in the module configurations that work with web services: for workflows, e.g. for connecting signature service providers, in the Workflow Designer (REST, SOAP) and for validations in the file cabinet configuration (REST).

With DocuWare you can use all available and suitable REST web services. If you want to use a SOAP web service for application in Workflow Manager, it must be developed for the purpose. For this, you can contact your DocuWare partner. You can find more information on REST and SOAP web services and a demo example of a SOAP service [here](#).

**Webhooks:** Here you register webhook URLs for DocuWare's communication with third-party applications. DocuWare sends the notification as a POST request to the URL that monitors the third-party application and thus receives the message. This feature can be used, for example, to notify other business applications when documents are re-filed in a file cabinet or associated index entries are changed. For certain applications, templates are available for user selection.

## 2.2 Windows-based applications

Windows-based applications in the DocuWare system include administrative applications and services, the Client Setup and DocuWare Update, user applications as well as DocuWare Request.

### User applications (Windows)

User applications comprise all applications that run under Windows on a user's client computer and are available for users. An important portion of these are summarized under the DocuWare Desktop Apps.

### DocuWare Desktop Apps

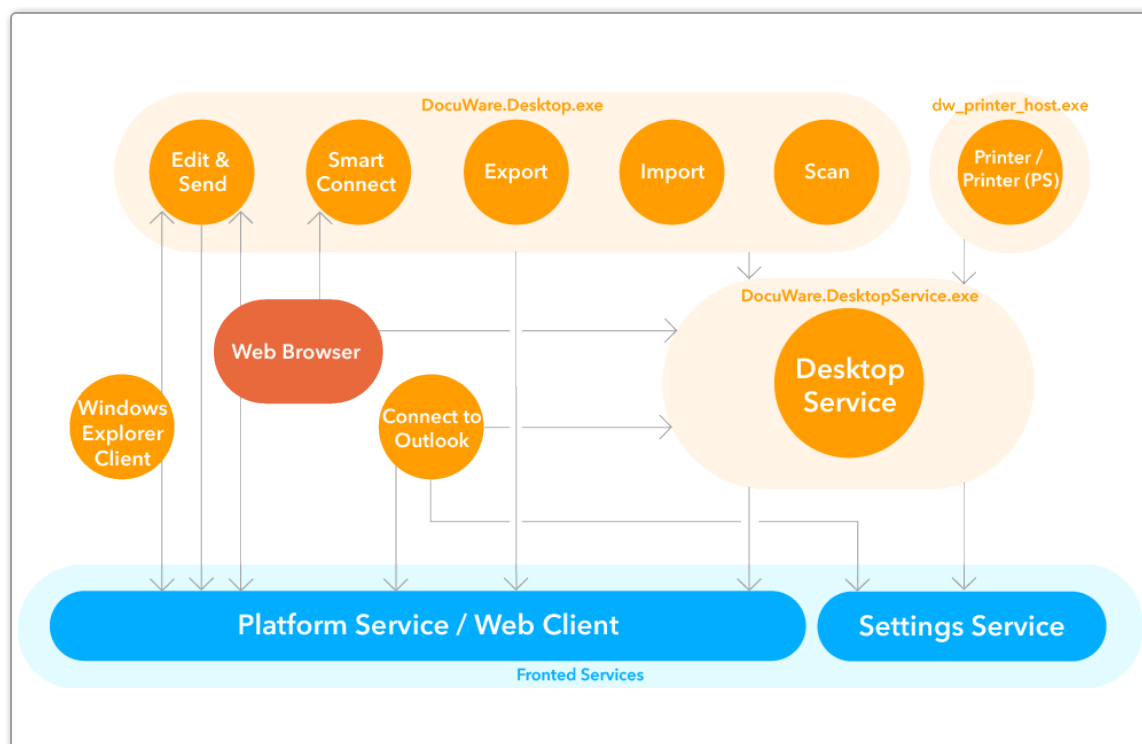
The DocuWare Desktop Apps component runs in the Windows notification field (tray area). It acts as a platform under which the following client components and functions are consolidated:

- Edit & Send
- Export
- Import
- Printer
- Scan
- Smart Connect

The entry data for these applications and functions are sent to the Platform Service and, respectively, to the Web Client (Smart Connect).

The DocuWare connections between the client and the DocuWare system are also established here. The connections can be used by DocuWare Desktop Apps as well as by the Connect to Outlook and Windows Explorer Client components.

Individual Desktop Apps access the Platform Service using the .NET API platform.



*The processes of the DocuWare Desktop Apps and other components that use these processes*

Desktop Apps are installed on the client PC directly from the Web Client.

**Desktop Service:** Desktop Service is required for operating DocuWare Desktop Apps. It runs once on each computer connected to a DocuWare installation and establishes the connection between DocuWare Desktop Apps and DocuWare servers. The service serves as host for various local services and allows them to access interfaces.



The Desktop Service retrieves the processing configurations for importing, processing, and storing documents in DocuWare from the Settings Service.

The Desktop Service transfers the documents to the [Platform Service](#) (page 20) for storage in the file cabinet. The fulltext generated by the DocuWare Desktop Apps is also stored at the storage location by the Desktop Server using the Platform Service.

The component is installed with the Client setup as part of the Desktop Apps.

**Edit & Send:** The Edit & Send application allows DocuWare Web Client to open and edit documents in the user's default application for the corresponding file type and to transfer documents to the standard email client.

The application runs in the background without any user interface.

**Export:** With DocuWare Export, you export index data of documents for data exchange with third party applications. This is especially useful to integrate DocuWare with ERP and accounting systems. For example, export invoice index data to import them into your accounting system. Any accounting and ERP system capable of accepting a flat CSV file as input can utilize the data export.

DocuWare Export is configured in DocuWare Configuration under Export Data.

Exports are started using the DocuWare Export app, which is a standalone Desktop App.

**Import:** DocuWare Import monitors selected directories in the file system or network and moves the files stored there automatically to DocuWare document trays or file cabinets.

Processing documents when importing, for example indexing, can be controlled using document processing configurations, which are determined in the DocuWare Configuration under [Document processing](#).

**Printer:** DocuWare Printer allows you to archive documents in DocuWare using the print function of your third-party applications. The documents can also be printed out on paper on a printer. Processing documents when printing, for example indexing, can also be controlled using configurations, which are determined in the DocuWare Configuration under *Document Processing*.

The component technically consists of a virtual print driver that generates PDFs. DocuWare Printer only appears in the printer list of third-party applications and is not a visual component by DocuWare Desktop Apps.

**Scan:** With DocuWare Scan, the user can scan paper documents, import the document scans in DocuWare, and store them in the PDF/A long-term archiving format in his or her default document tray or in a DocuWare file cabinet. Any scanner installed on the user's PC (which has TWAIN and WIA drivers) can be used for this.

The user defines the settings for Scan directly in the client application. In order to be able to store the documents in a DocuWare file cabinet, the user must also be assigned a suitable processing configuration, which is created in the DocuWare Configuration under [Document Processing](#).

**Smart Connect:** You can use DocuWare Smart Connect to connect any Windows application you like with the DocuWare file cabinet without any programming. It helps the user search for documents in DocuWare and index documents from third-party applications. To do this, Smart Connect reads content from the user interface of any application of your choice, and transfers this to DocuWare as a search or index entry.



When applying Smart Connect, a configuration created in [DocuWare Configuration](#) is always executed.

**Connect to Outlook:** With Connect to Outlook, you archive your emails directly in DocuWare from Microsoft Outlook and use quick search to access stored emails.

Configurations for Connect to Outlook are defined in the DocuWare Configuration.

The component accesses the DocuWare servers using the Platform Service.

Both the 32 and 64-bit versions of Microsoft Outlook as well as Office 365 are supported.

**Windows Explorer Client:** The Windows Explorer Client integrates DocuWare file cabinets into the Windows file directory and shows the file cabinets in the folder file structure that users are accustomed to. The Windows Explorer Client is implemented as a Windows Explorer name range enhancement and loaded with this process.

The component draws the connection information for the DocuWare system from DocuWare Desktop Apps. It receives the settings via the Settings Service. Windows Explorer Client accesses the DocuWare servers using the Platform Service.

### **Administrative applications (Windows)**

The administrative applications are DocuWare Administration, Workflow Designer, User Synchronization, URL Creator, and Index Cleaner.

**DocuWare Administration:** DocuWare is administrated using DocuWare Configuration and DocuWare Administration. Use the DocuWare Administration to set up your DocuWare system and manage a certain part of the settings. The application calls up the required information directly from the backend servers, especially from the Authentication Server. Administration is divided into two areas:

Under "DocuWare System," you can find general settings for the items:

- DocuWare Server
- Database connections
- Document storage locations
- External user directories
- Backup
- Web connections

Under "Organizations," you can find settings for the items:

- Licenses
- Web instances
- File connections
- User administration
- File cabinets: Disk management

DocuWare Administration can run on any computer which has access to the backend servers. Every user with access to the .exe file can start the program. However, depending on the permissions a user has been granted, certain nodes, menus, and dialog boxes may not be visible. Data that is being edited by one user is locked for other users and can only be accessed in read-only mode.

You make all other general settings and security settings in the [DocuWare Configuration](#).

**Workflow Designer:** The Workflow Designer component allows you to create, edit, and publish workflow configurations for the Workflow Manager module. When you use Workflow Manager, a previously created configuration is always run and a new instance of the workflow is therefore created each time.

Among other things, which task is to be completed and which decisions are to be made in it are specified in a workflow configuration. In addition to a user or role, a task may also be assigned to a substitution rule.

You can export a workflow and import it into another file cabinet. The selected file cabinet can belong to your organization or be in another system. The import is possible as a new workflow or as a new version. It is essential that the source and target file cabinets match for an import.

The Workflow Designer calls up the settings from the [Background Process Service](#) (page 24) and other backend services using the [Settings Service](#) (page 21).

Workflow Designer forwards all information for workflow task lists in the Web Client using the [DocuWare Platform Service](#) (page 20).

The component draws the connection information for the DocuWare system from DocuWare Desktop Apps.

**User Synchronization:** With this component, you automatically synchronize users and groups with your DocuWare system from Microsoft Active Directory via LDAP (Lightweight Directory Access Protocol) or from Microsoft Graph.

The user synchronization does not obtain the connection information to the DocuWare system from the Desktop Apps, but these must be explicitly specified and stored. This ensures that the user synchronization is performed without the Desktop Apps and unattended.

**URL Creator:** The DocuWare URL Creator is a wizard for creating URL integration. The tool automatically compiles the URL and adopts the Base64 coding required for certain parameters and the encryption.

**Index Cleaner:** Index Cleaner is a wizard for cleaning file cabinet index entries for which various spellings have accumulated.

The component draws the connection information for the DocuWare system from DocuWare Desktop Apps.

## 2.3 Mobile clients

With DocuWare mobile clients, also called Apps, you access DocuWare directly from your mobile device, whether using iOS or Android.

### DocuWare

You can also access all documents, participate in workflows and store documents, images and files on your smartphone, even from other apps. The free app is connected to your DocuWare system via QR code.

The app requires an active connection to your DocuWare system. Files are stored locally on the mobile device.

DocuWare Mobile connects directly to the platform service.

### **PaperScan**

With the PaperScan app, you can scan documents with the highest quality and upload them to Dropbox, Google Drive or DocuWare, allowing other users to access them when needed. The scans are only stored locally. Only when the user stores them in one of the cloud services mentioned above, the data is transferred to an external server.

PaperScan connects directly to DocuWare's Platform Service.

## 3 Frontend Services

The DocuWare Frontend Services are based largely on the Internet Information Services (IIS), a service platform by Microsoft. This allows the services to be easily operated with TLS/SSL encryption by adjusting the IIS configuration.

The following sections provide information about the components associated with the DocuWare Web Servers:

- Platform Service and Web Client
- Settings Service
- Identity Service

Load balancing is possible for all three services.

Information on installing and managing the Web Servers can be found in the [Server Setup](#) (page 54) section.

### 3.1 Platform Service and Web Client

The DocuWare Platform Service bundles access to all DocuWare services in an efficient interface open for all programming languages. In addition, all third-party applications can be very easily connected to DocuWare for access to the DocuWare resources.

The Platform Service is automatically installed during setup and can be accessed in the Internet Information Services (IIS) on the used Web Server under the address `https://<Servername>/DocuWare/Platform`. It enables uniform access for all clients and to any device. This works both with DocuWare applications and with third-party applications based on the DocuWare .NET SDK.

The Platform Service accesses the Authentication Server and the databases directly.

By using HTTPS and the modern architectural style Representational State Transfer (REST), the Platform Service is extremely efficient and acts as a uniform interface for very different connections. Resources are embedded into the third-party application through XML or JSON. The Platform Service contains an overview of the available resources and documentation about how to use them. An annotated XML Schema Definition (XSD) is attached to all data formats, from which documentation is automatically created and which is always up-to-date. Thanks to XSD, libraries to simplify programming can be automatically created for various target platforms. The libraries can easily be updated to ensure that data formats remain up to date. DocuWare provides a [.NET API on NuGet](#) for .NET developers to guarantee user-friendliness.

You can also directly log into a DocuWare system from the Platform Service in order to see information such as search dialog IDs or file cabinet GUIDs. URI templates for integrating resources also save the developer time.

Applications that use the Platform Service are also compatible with future versions of DocuWare. This means that when DocuWare is upgraded to a new version, client applications do not necessarily have to be updated.

The Platform Service supports a diverse array of procedures which speed up HTTP-based web applications. HTTP caching methods bring a significant increase in speed across many scenarios. The platform also supports transparent compression and works behind proxies.

For more information, see the [DocuWare Developer Documentation](#).

## Web Client

Web Client, which provides DocuWare's graphic user interface for working with documents (see also the section [Web Client](#) in the chapter "Client Applications"), is integrated in the Platform Service.

The Web Client can be accessed under the address *https://<Server name>/DocuWare/Platform/WebClient* and uses the same services provided by the Platform Service.

## Workflows for Workflow Manager

This platform service processes for Workflow Manager the data that is generated by user interaction in DocuWare Client, for example inputs like confirmation of tasks.

## 3.2 Settings Service

The Settings Service provides access to most DocuWare system settings. The DocuWare Configuration runs in the Settings Service.

The Settings Service calls up settings directly from the databases and delivers them to client applications. The interface is not approved for in-house programming.

The Settings Service transmits the storage capacities for administration of the DocuWare document trays. The Settings Service manages the request workflow using the Background Process Service.

## 3.3 Identity Service

Together with the Authentication Server, the Identity Service is responsible for user login. The Identity Service handles authentication via single sign-on (SSO) and DocuWare authentication. As a central service, it is responsible for all organizations within a DocuWare system and thus also for the DocuWare login page. It ensures that the DocuWare login page always opens, regardless of which DocuWare application (Web Client, Configuration, Desktop Apps or Mobile) and to which organization a connection is to be established.

As an additional feature, SSO can be enabled and disabled. If it is enabled, you will see the SSO button on the login page. By default, SSO is enabled and set with Microsoft Active Directory via NTLM (Windows Login). This can be disabled or switched to, for example, Azure AD or ADFS via OpenID Connect. Enforcing SSO is optionally available for all identity providers. This allows you to specify that users can no longer log in with DocuWare credentials, but only via SSO. Thus in a DocuWare system, you use secure multi-factor authentication (MFA). By enforcing SSO within DocuWare, you can also indirectly force users to use MFA, as long as MFA is set up at the identity provider (e.g. Azure AD or ADFS).

The Identity Service accesses the database directly and communicates with Platform Service, Settings Service and Authentication Server.

If you use the internal MySQL database of DocuWare, it must be updated to version 2. If you use an individual MySQL installation it must be updated to MySQL version 5.6 or higher.

## 4 Backend services

Backend services are the servers in a DocuWare system that are managed via DocuWare Administration. They are used to run all background processes and access document storage locations as well as databases.

You will find information on backend services in the following:

- Authentication Server
- Background Process Service
- Workflow Server

Information on installing and managing the backend services can be found in the [Server Setup](#) (page 54) section.

### 4.1 Authentication Server

Authentication Server manages all users and resources of a DocuWare system. Before you can use the system, you must always log in to the Authentication Server.

It handles the following tasks:

- User login
- License management
- Administration of several resources at system level such as database connections

Before you can use the system, you must always log in to the Authentication Server.

In order for DocuWare to be multi-client enabled, users are allocated to "organizations," which are managed by the Authentication Server. An organization thus comprises the following as a logical structure:

The Authentication Server stores the settings in the DWSYSTEM database. The Authentication Server transmits changes in settings to other components via [Message Bus](#) (page 45).

The Authentication Server is managed in DocuWare Administration.

### 4.2 Settings Service

The Settings Service manages most resources of a DocuWare system including the users.

In order for DocuWare to be multi-client enabled, the users and other resources are assigned to "organizations," which are managed by the Authentication Server. An organization thus comprises the following as a logical structure:

- Users and user groups
- File cabinets, including their associated disks
- Processes

- Templates for stamps, formats for recognizing text (OCR) and barcodes (OBR), select lists
- Audit report

DocuWare uses a role concept for permissions. A role for user groups or individual users on one side connects to permissions profiles or individual permissions on the other. Individual users can be assigned individual permissions independently from this process.

Authentication Server is therefore used by:

- One or more organizations each with
- At least one or more users

Additional information on the permissions concept can be found in DocuWare's [White Paper Security](#).

## 4.3 Background Process Service

The DocuWare system runs various background processes, the following of which are hosted in the Background Process Service:

- Autoindex
- Creating and importing self-supporting DocuWare Request file cabinets
- Control of workflows
- Customer Experience Improvement Program (CEIP)
- Email notifications
- Export of documents
- Deletion policies
- File cabinet synchronization
- Fulltext structure
- General Email
- Intelligent Indexing
- Transfer

The background processes are managed in DocuWare Configuration. Exceptions are the processes CEIP, transfer and export of documents, which are managed in DocuWare Administration.

### Autoindex

The Background Process Service checks the saved user ID against the Authentication Server, calls up data from configured sources, and communicates with the Platform Service for indexing. It also automatically starts Autoindex at a defined file cabinet event, for example the storage of a new document.

### Control of workflows

The Background Process Service stores and manages workflow configurations and workflow instances from the Workflow Manager module.



One new workflow instance is generated per edited document. These workflow instances are controlled by entries in the DWSYSTEM.DWTasksWFE table. The workflow configurations and workflow instances are stored by the Background Process Service in the DWORKFLOWENGINE database and called up from there.

All settings that affect permissions and other sensitive data are called up by the Background Process Service from the Authentication Server.

### **Fulltext structure**

The Background Process Service is responsible for extracting fulltext in the event that this data is not included by the client during the storage process. This is the case for several DocuWare Desktop Apps. The Background Process Server stores the fulltext in the DWDATA database and forwards it to the Fulltext server at the same time.

### **Deletion Policy**

The Background Process Service manages the rules for deleting documents. These rules are defined through filters.

### **Document Export**

The Background Process Service exports file cabinets or partial file cabinets by creating a copy of a file cabinet or individual documents. A DocuWare file cabinet export includes both the documents and the database entries.

The target of the export are file cabinets within the DocuWare system. You can export into new or existing file cabinets within the DocuWare system.

### **Email Notifications**

The Business Process Service manages email notifications for the Workflow Manager and the Task Manager modules. If a trigger setting is set for a processed document, the DocuWare servers generate an event. There are two possible trigger settings:

- A document is stored.
- A document's index data changes.
- A time trigger was set.

The DocuWare server generate an entry in the database table (DWSYSTEM.DWTASKS). The process reads the task from there and processes it.

Depending on which database subscriptions have been set up, the process multiplies the events for email notifications and sends the notification using its SMTP connection.

### **General Email**

For storage, the Background Process Service sends the documents to the Platform Service.

### **Intelligent Indexing**

If there are conditions saved for the hosted Intelligent Indexing Service, the Background Process Service starts the document indexing order, creates structure data, and sends it to the Intelligent Indexing Service.

After indexing, the Intelligent Indexing Service returns the meta data, which the Background Process Service stores in the data store after the suggested index data has been corrected by the user.

Finally, the Background Process Service sends the corrected data to the [Intelligent Indexing Service](#), which takes it into account for future queries.

## 4.4 Workflow Server

The following background processes are hosted on the Workflow Server:

- backup and restore of data
- user synchronization
- export of documents

### Backup and restore

The backup and restore process saves the file cabinet settings, the users and permissions of your DocuWare system, and also the Workflow Manager configurations.

The component is managed in DocuWare Administration.

### User synchronization

DocuWare permits the synchronization of its users and groups, both with Windows directories and through LDAP. Configurations for the synchronization with external user directories are specified on the system level and can be made available to the individual organizations.

The configurations set up on the system level are used to set up the workflows. The scheduling for the Synchronization workflow is also set on this level. The organization administrator also assigns DocuWare groups and users of his organization to external groups and users as the basis for the synchronization.

The component is managed in DocuWare Administration.

## 4.5 Administrative applications and services

The administrative applications and services in the backend servers include:

- **Service Control**  
As a Windows administrator you can start and stop individual backend services in the DocuWare Service Control. The component is installed with the [Server Setup](#) (page 54) as standard.
- **Message Bus Administration**  
DocuWare services use Message Bus for communication through use of the Message Bus Administration.  
The component is installed with the [Server Setup](#) (page 54) as standard.

- **Migration of documents**

With the Document Tool you can migrate documents within a file cabinet to another disk with another disk number. As a rule, a migration is started in order to reduce the disk sizes within a file cabinet or to combine disks. For example, a file cabinet can be saved to disks in the same size as a CD/DVD in order to prepare the transfer to external media.

- **Index restores**

With the Document Tool, you can restore the index entries of a DocuWare file cabinet in the database from the stored documents. The database structure must be available in order to restore the database information using the saved document.

## 5 Databases, storage locations, and fulltext index

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

### 5.1 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.

#### Supported database systems

All market-leading database systems can be coupled with a DocuWare system: MS SQL Server, Oracle Server, and MySQL Server. 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). As an alternative, you can also connect an Oracle database. Please 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](#) (page 54).

If an MSSQL database is used, the archive name can be up to 128 characters long, with MySQL up to 64 and with Oracle up to 32 characters.

#### The 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.
- **Database for document data (DWDATA)**  
This database contains all internal system information for searching and finding documents. You can create several such databases. For more details, see the "Database for document data" section below.

- Notification database (DWNOTIFICATION)  
This database contains all the events that the Background Process Service needs to run workflows and email notifications.
- Workflow Engine database (DWORKFLOWENGINE)  
This database contains all information required by the Background Process Service for creating, editing, and executing workflow configurations.

**The database for document data (DWDATA)**

Searching and finding documents stored in DocuWare always occurs in the database for document data (DWDATA). This is where the DocuWare services store the index data of each document in a structured form (relational) and optionally also in the form of a fulltext index.

The database not only manages the search criteria that are relevant for the user, but also the system-internal information needed for storing and retrieving the documents in the file cabinets. The key characteristic of a document is its DOCID, a unique number within each file cabinet. The DOCID refers to the complete document even if it consists of multiple files.

The fields specify the keywords and categories by which documents are stored and retrieved.

Thanks to separate keyword tables, it is theoretically possible to have an unlimited number of keywords for each document. Moreover, it is possible to create several keyword fields in one file cabinet. The speed for searching in keyword fields is very high since the keyword column in the table is indexed. As soon as the corresponding entry is found, the DOCID allows direct access to the database entries of the associated documents.

There are also separate tables for the table fields. The entries for the tables are only available for the full text search. The table field tables are limited to 50 columns per table. For each document, 1000 lines can be stored in the table.

If you are using a tool that addresses an archive of table fields, you may need to update it to the Platform.NET API version 7.1 or higher.

The database for document data contains the following tables:

Name	Mandatory	Usage	Counterpart in DocuWare Versions up to 6.12
<FCName>	Yes	File cabinet main table	<FCName>
<FCName>_SEC	Yes	Section table	<FCName>_SECT
<FCName>_PAG	Yes	Page table	<FCName>_PAGE
<FCName>_PGT	Yes	Page textshots	
<FCName>_VRS	Yes	Old versions (not current version)	<FCName>_VER
<FCName>_AUD	Yes	Protocol table	
<FCName>_DSK	Yes	Disk table	<FCName>_DSKS
<FCName>_LCK	Yes	Locking table	<FCName>_LOCK
<FCName>_IDT	Yes	Document ID table	
<FCName>_DELz	Yes	Table of deleted documents (Sync)	<FCName>_RD
<FCName>_ <KeywordFieldName>[nn]	Per keyword field	Keyword table	Remained the same
<FCName>_ <TableFieldName>[nn]	Per table field	Table-field table	

Name	Usage
<FCName>_V5	Old documents (created with DocuWare up to Version 6.12; not processed with DocuWare Version 7 or higher)
<FCName>_V5S	Old sections (created with DocuWare up to Version 6.12; not processed with DocuWare Version 7 or higher)
<FCName>_V5P	Old pages (created with DocuWare up to Version 6.12; not processed with DocuWare Version 7 or higher)
<FCName>_V5V	Old versions (created with DocuWare up to Version 6.12; not processed with DocuWare Version 7 or higher)
<FCName>_ <KeywordFieldname>[nn]V5	Keyword fields for old versions (created with DocuWare up to Version 6.12; not processed with DocuWare Version 7 or higher)

Name	Mandatory	Usage
<FCName>_EVNT	Yes	Workflow Manager: Event sources
<FCName>_HTRY	Yes	Workflow Manager: History
<FCName>_SHOT	Yes	Workflow Manager: Snapshots
<FCName>_STTR	Yes	Workflow Manager: Read status
<FCName>_STTW	Yes	Workflow Manager: Write status
<FCName>_W[nnn]	Per workflow configuration	Workflow Manager: Task list

## 5.2 Supported storage locations for file cabinets and document trays

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, because CD/DVDs cannot be burnt in succession.

## **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.

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.

### **EMC Centera (Dell EMC ECS)**

EMC Centera is a special content-addressed storage method (CAS) on hard disks, in which the access to stored information is not based on its position on the physical medium, but on the content of the information. This ensures that documents with identical content are physically stored only once. The method allows access to individual documents while ensuring that the stored information remains unalterable.

EMC Centera functionality has now been absorbed into the Dell EMC ECS object storage platform. DocuWare systems already configured for EMC Centera work with DocuWare without additional effort. Administration and document operations remain the same with Dell EMC ECS. DocuWare uses the 64-bit FPLibrary.dll connector. DocuWare supports only the Dell Centera backward compatibility service and no other features provided by Dell with EMC ECS.

## **5.3 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](#) (page 41) section.

## 6 Architecture of the file cabinets

DocuWare stores all documents in file cabinets where they can be saved long-term. Each file cabinet is assigned to a DocuWare organization. Users access documents in the DocuWare interface using a search query in the respective file cabinet or in multiple file cabinets.

Every organization has at least one file cabinet for storing documents. Under file cabinet settings, you can determine:

- General file cabinet characteristics, e.g. name, etc.
- The database to be used for the documents' index information and any additional database-related settings
- The storage location to be used for the documents and (if applicable) their subdivision into logical disks with associated capacity limits
- File cabinet fields / index fields
- Access rights and file cabinet profiles for the archive or for individual fields
- The user dialogs for file storage, searches, results list, and folder structures
- Additional functionalities, e.g. availability of a fulltext index, type, and extent of the stamps that are available for document processing

### 6.1 The "disk" concept

The documents of a file cabinet are stored on "DocuWare disks." DocuWare disks are generally directories in the file cabinet identified by a name that DocuWare has assigned them. The subdivision of the file cabinet into logical disks is a means of organizing the storage media.

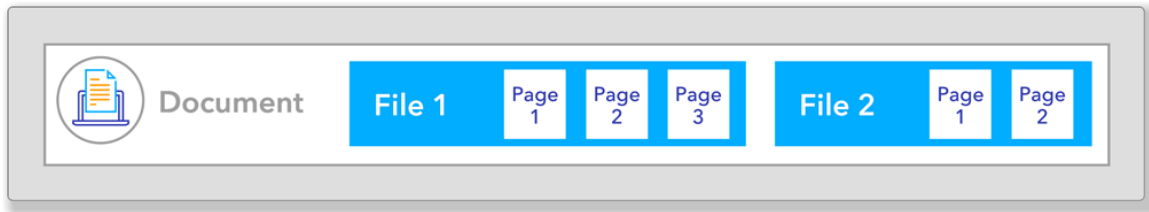
You can transfer these logical disks to another medium at any time you choose, for example when they reach a certain size. Document management with DocuWare has the advantage that documents can be swapped out either by pre-defined rules or automatically. DocuWare offers features for conveniently automating the corresponding steps.

The concept of logical disks and the open file structure gives the administrator a high degree of transparency and flexibility when managing the DocuWare system.

### 6.2 Document structure

A document in DocuWare can consist of one or more files. In addition, a document can be composed of a combination of various file formats, e.g. PDF/A, PDF, MS Excel, for instance if DocuWare accepts an email with several attachments as an associated document.

Again, each file comprises one or more pages:



*The structure of a document that contains two files: one with three and one with two pages*

Example 1:

A 3-page paper document that was scanned into DocuWare consists of a 3-page PDF/A file.

Example 2 (see graphic above):

For a document, a 3-page PDF/A file generated by DocuWare and a 2-page Word file are clipped together in the document tray.

Example 3:

For one document, a PDF/A file generated by DocuWare, a 3-page Word file and a 2-page PDF file are clipped together in the tray. The document then consists of three files:

1. File of the document: PDF/A file with page 1
2. File of the document: Word file with pages 1, 2, and 3
3. File of the document: PDF file with pages 1 and 2

Annotations can be made on every page of a file within a document, on multiple annotation levels if required. Annotations are stored with their characteristics and additional attributes and reproduced for the duration by the DocuWare Viewer.

Each document in DocuWare can have a maximum of 999 document files.

Documents scanned and printed with DocuWare applications are stored in the DocuWare file cabinets as PDF/A files. All other documents that are read into DocuWare, such as PDF and MS Office files, are stored in their original formats.

All additional metadata such as stamps, index data, and annotations are automatically stored in the file cabinet database. Copies of these data can optionally be saved in a ZIP-based file format (extension.DWX) in the file cabinet location. They are updated asynchronously, not as part of the document change. After upgrading to DocuWare Version 7, this redundant storage option for on-premises is set to ON. This also applies to new file cabinets.

A command line tool is available for restoring database entries from the file cabinet location.

Each document file has a unique name (GUID).

When a document file is updated, the file in the memory is not overwritten. Instead, a new unique name (GUID) is generated. After the new file is created, the old one is deleted.

The file structure of documents stored with DocuWare Version 6.x or earlier is not changed and their header files are still used. If such a document or its index entries are changed in DocuWare from Version 7 (e.g. if a comment is added in the viewer), the document's metadata is copied to the database and the header file existing in previous DocuWare versions is deleted. When a document file is updated, it uses the new file naming convention (GUID).

## 6.3 File structure

With DocuWare version 7, the file structure of the documents has changed. If you were already using DocuWare version 6.12 or earlier and are now working with version 7 or higher, your documents are stored in different structures.

Documents that were stored before version 7 will only be transferred to the new file structure if they are edited or their index entries are changed.

	DocuWare Version 7 and higher	Up to DocuWare Version 6.12
<b>Document file name</b>	GUID	Continuous number
<b>Index data and annotations</b>	DWX file (optional)	Header file

From DocuWare Version 7, the (double) storage of additional metadata in a DWX file per document file is optional. If it is not used, this can result in a performance gain.

### Documents stored with DocuWare version 7 or higher

All additional metadata such as index data, stamps, and annotations are automatically stored in the file cabinet database.

Copies of these data can optionally be saved in a ZIP-based file format (extension.DWX) in the file cabinet location. They are updated asynchronously, not as part of the document change. This redundant storage option is set to ON by default, which also applies to new file cabinets.

To restore database entries from the file cabinet location, a command line tool is available.

The index data and annotations of documents are stored twice in DocuWare Version 7 or higher: in the database and in the document memory in a DWX file. This guarantees the greatest possible amount of security, as in the event of a failure the documents and their index data will still be accessible without backing up.

### DWX file

A metadata file in DWX format can be created for each stored document. To do this, the option *Index data backup* in the storage location for the file cabinet must be enabled in the DocuWare configuration under *File Cabinets*.

For each file that is part of a DocuWare document, the DWX file contains a separate section. Within the DWX file, the main elements are:

- Document description: Information relating to the whole document, e.g. signatures, versions, and encryption
- Meta data (Document meta data):
  - System properties: All described data required by DocuWare for management from the system's point of view e.g. DWDOCID
  - User data All described data required from the user's point of view, e.g. index data, field properties
  - Store Properties: Information about the history and the logical file cabinet of the file.
  - Application Properties: Information required for integration with other applications.
- Page information: Page-specific additions, e.g. text annotations, stamps, etc.

All data are identical to the data in the database and are therefore stored twice. This guarantees the greatest possible amount of security, as in the event of a failure the documents and all their information will still be accessible without backing up. However, restoring can take a lot of time and therefore is not a replacement for conventional database backup.

The DWX files are created asynchronously to the document operations in the DocuWare system. This means that the processes in DocuWare (e.g. storing a document and creating the DWX file) do not take place at the same time, but independently of each other.

### Documents stored with DocuWare version 6.12 or earlier

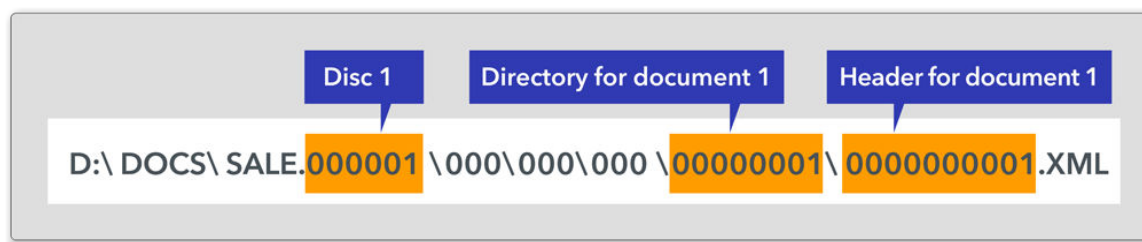
The structure of documents stored with DocuWare version 6.12 or earlier (and not processed with DocuWare version 7 or higher) is as follows.

Under the file directory allocated by the administrator, the DocuWare directory is addressed by file cabinet names, disk numbers, three directory levels, and the document level. A maximum of around 2.15 billion documents may be stored in one file cabinet.

DocuWare creates a separate directory for each file cabinet in the selected storage location on each disk. Each file cabinet directory is named with *<file cabinet name>.<disk number>*. Here, the file cabinet name has a maximum of 8 characters and the disk number is always 6 digits. The first disk of the document pool file cabinet is thus called *Document.000001*.

On the three underlying directory levels, each directory has a 3-digit sequential number, starting with 000. On the first of the three levels, a maximum of 128 folders are possible (000 to 127), while the second and third levels each have a maximum of 256 (000 to 255).

The document directories can be found under these three directory levels. If for example you allocate the directory D:\DOCS and the name SALE to the file cabinet, the documents of the first disk will reside in the following subdirectory:



Each of these document directories contains all pages (files) of a document, and the header file in XML format. The document directories are given the name of the DocID (a 10-digit document number which is unique within the file cabinet), which is also sequential (from 0000000001 to  $(2^{31}-1) = 2,147,483,647 \sim 2.15b$ ). With the DocID, each document receives a unique sequential number which increases automatically by 1 for each new document.

The header file is always called *<Document number>.XML* and has no size restriction.

The document files are always called F (File), followed by a sequential number starting with 0, and the file extension (e.g. docx, xlsx, pdf), so for example *F0.doc*. A document that consists of several parts would therefore be represented like this:

```
\000000001\ 0000000001.XML
\F0.docx
\F1.xlsx
\F2.pdf
\F3.pdf
```

You can create up to 999,999 DocuWare disks, though not within one directory, since Windows limits the number of sub-directories within each directory.

The example below shows the file structure within a DocuWare file cabinet. Here it is assumed that all documents are stored on a single DocuWare disk.

#### Example file structure of a DocuWare file cabinet on the file system level

```
D:\File_cabinets\Document.000001\
D:\File_cabinets\Document.000001\000\
D:\File_cabinets\Document.000001\000\000\
D:\File_cabinets\Document.000001\000\000\000\
D:\File_cabinets\Document.000001\000\000\000\0000000001\ (first document in file
cabinet)
D:\File_cabinets\Document.000001\000\000\000\0000000001\0000000001.XML
D:\File_cabinets\Document.000001\000\000\000\0000000001\F0.doc
D:\File_cabinets\Document.000001\000\000\000\0000000001\F1.xls
D:\File_cabinets\Document.000001\000\000\000\0000000001\F2.pdf
...
D:\File_cabinets\Document.000001\000\000\000\0000000002\ (second document in file
cabinet)
D:\File_cabinets\Document.000001\000\000\000\0000000002\0000000002.XML
D:\File_cabinets\Document.000001\000\000\000\0000000002\F0.xls
...
...
D:\File_cabinets\Document.000001\000\000\000\0000000256\ (last document in
000\000\000)
D:\File_cabinets\Document.000001\000\000\000\0000000256\0000000256.XML
D:\File_cabinets\Document.000001\000\000\000\0000000256\F0.pdf
...
D:\File_cabinets\Document.000001\000\000\001\
D:\File_cabinets\Document.000001\000\000\001\0000000257\ (first document in
000\000\001)
D:\File_cabinets\Document.000001\000\000\001\0000000257\0000000257.XML
```

D:\File\_cabinets\Document.000001\000\000\001\0000000257\F0.doc  
...  
...  
D:\File\_cabinets\Document.000001\000\000\001\0000000511\ (last document in 000\000\001)  
...  
...  
D:\File\_cabinets\Document.000001\000\000\002\  
D:\File\_cabinets\Document.000001\000\000\002\0000000512\ (first document in 000\000\002)  
...  
...  
D:\File\_cabinets\Document.000001\000\000\255\  
D:\File\_cabinets\Document.000001\000\000\255\0000065535\ (last document in 000\000\255)  
...  
...  
D:\File\_cabinets\Document.000001\000\001\000\  
D:\File\_cabinets\Document.000001\000\001\000\0000065536\ (first document in 000\001\000)  
...  
...  
D:\File\_cabinets\Document.000001\000\255\255\  
D:\File\_cabinets\Document.000001\000\255\255\0016777215\ (last document in 000\255\255)  
...  
...  
D:\File\_cabinets\Document.000001\001\000\000\  
D:\File\_cabinets\Document.000001\001\000\000\0016777216\ (first document in 001\000\000)  
...  
...  
D:\File\_cabinets\Document.000001\127\255\255\  
D:\File\_cabinets\Document.000001\127\255\255\2147483647\ (last document in file cabinet)

## Header File

Every document stored with a DocuWare Version up to 6.12 and not modified after storage has a header file in XML format. The header contains the meta and index data assigned for the document, as well as annotations, stamps, signatures, etc.

The index data are thus duplicated: they appear once in the database and once in the document header file. This guarantees the greatest possible amount of security, as in the event of a failure the documents and their index data will still be accessible without backing up. However, this process can take a lot of time and therefore does not represent a replacement for conventional data backup procedures.

For each file that is part of a DocuWare document the header file contains a separate section.

Within the header file, the elements "Document description," "meta data," and "page information" can be fundamentally distinguished:

- Document description:  
Information relating to the whole document, such as signatures and encryption
- Meta data (Document meta data)
  - All described data required by DocuWare for management from the system's point of view (system properties), e.g. the Document ID. This data is identical to the index data which the database maintains for every file.
  - All described data on the document required from the user's point of view: index data, field properties
  - Store Properties contains information about the history and the logical file cabinet of the file.
  - Application Properties are information that is required for integration with other applications, for example with SAP.
- Page descriptions:  
Page-specific information, such as written or spoken annotations, levels, stamps, etc.

### **Write Access Conversion**

The file structure of documents stored with DocuWare Version 6.x or earlier is not changed and their header files are still used. If such a document is changed in DocuWare Version 7 or higher (e.g. if a comment is added in the viewer), the document's metadata is copied to the database and the header file is deleted. When a document file is updated, it uses the new file naming convention (GUID).



## 6.4 Fulltext functionality

DocuWare provides its own fulltext functionality, which allows you to run an effective search in the fulltext of documents and their index entries. The application is optional. The fulltext functionality operates as follows.

The [Background Process Service](#) (page 24) extracts text shots from the document and stores these in the data store. The search terms of a document page and their position is marked in the text shots. This allows the results to be marked in the document.

At the same time, the Background Process Service transfers the text shots to the Fulltext Server. This stores the text shots again in catalog files (index files) and uses them for the search requests. The catalog files are created per DocuWare file cabinet. They are stored on the computer where the Fulltext Server is installed by default.

If an error occurs during indexing for the fulltext search, for example if a server is not accessible, the indexing of these documents is automatically repeated at a later time.

## 6.5 Special characteristics of document trays

The essential application scenario for document trays is the viewing of new documents and their processing before archiving. For this reason, new documents are often first imported into a document tray. This is also where the documents are evaluated using Intelligent Indexing. In addition, a document tray can be used for copies of documents that have already been archived.

Document trays are technically structured like archives and the data is stored in a simplified format. Unlike archives, however, document trays do not have a structured search or a full-text search, nor do they have a rights concept. They are usually configured so that only one user has access to them. In comparison to the analog world, they correspond to a filing basket for incoming documents on the desk.

In principle, it is also possible to give multiple users access to a document tray. However, it is important to note that no logging takes place in the document tray and no more precise assignment of rights is possible. Anyone who has access to a document tray may perform any action there. An individual action cannot be assigned to a specific user in retrospect.

## 6.6 File cabinet synchronization

Two file cabinets can be synchronized with each other using DocuWare (documents and database). This synchronization is managed in the DocuWare configuration. More information can be found [here](#).

In synchronization, both file cabinets to be synchronized are equivalent partners. The two documents are matched using globally unique GUIDs. One of the file cabinets to be synchronized must be located in the local system, the other one can be located in the same or in another DocuWare system.

The comparison between the file cabinets simply takes place in a text field column and so it also only takes a short amount of time. The synchronization process is executed through Cloud-compatible HTTPS by the Background Process Service.

## **6.7 Autonomous file cabinets - DocuWare Request**

Autonomous file cabinets make it possible to copy a (sub)archive to an external mass storage medium. The DocuWare Request component makes available complete file cabinets or selected documents available on external media (USB stick, CD/DVD, etc.) as a ZIP file.

A request file cabinet is an independent component that can operate without installing DocuWare. It comprises the document, an SQLite database, and a QtWebKit browser. The browser offers a search function and a PDF viewer.

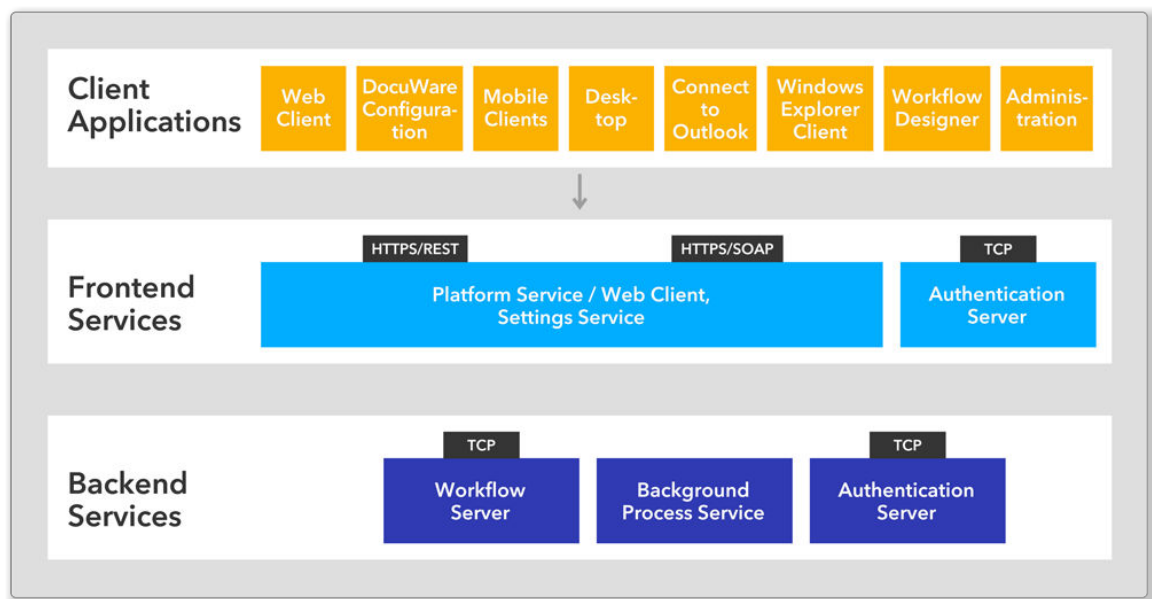
## 7 Communication technologies

The DocuWare System components communicate with each other according to the latest standards. The following sections tell you about the protocols used and which individual components exchange information about which standards.

### 7.1 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*

## 7.2 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				
	8090/8091	80/443	80/443	9000	9002
CLIENT APPLICATIONS	Local Desktop Service (HTTPS)	Platform Service / Web Client (HTTPS)	Settings Service / DocuWare Configuration (HTTPS)	Authentication Server (TCP)	Workflow Server (TCP)
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	X
Index Cleaner		X			
Mobile Client		X			
PaperScan Client		X			

## 7.3 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	SERVER							DATABASES			
	8090/8091	80/443	80/443	9000	9002	9012	443	DWDATA	DWSYSTEM	DWNOTIFICATION	DWWORKFLOWENGINE
Local Desktop Service (HTTPS)											
Platform Service / Web Client (HTTPS)				X		X	X	X	X	X	X
Settings Service				X	X	X	X	X	X	X	
Identity Service		X	X	X				X	X		
Authentication Server								X	X		
Workflow Server		X		X					X		
Notification Server				X					X	X	
Connect to SharePoint		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									

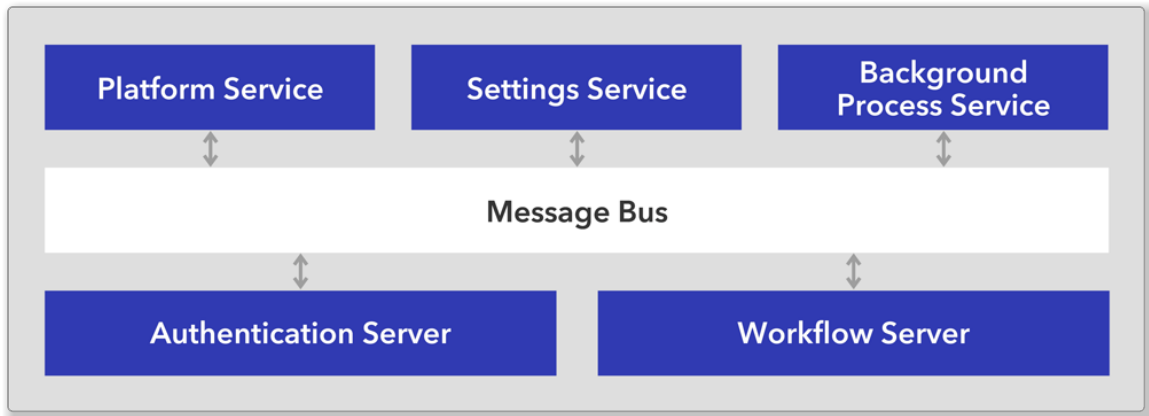
## 7.4 Message bus

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.



*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.

If DocuWare is to be installed on Microsoft Azure, DocuWare will be happy to assist you with the setup. For more information, see the [DocuWare Knowledge Base](#) or contact the DocuWare [Support](#).

## 8 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](#) (page 45) 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

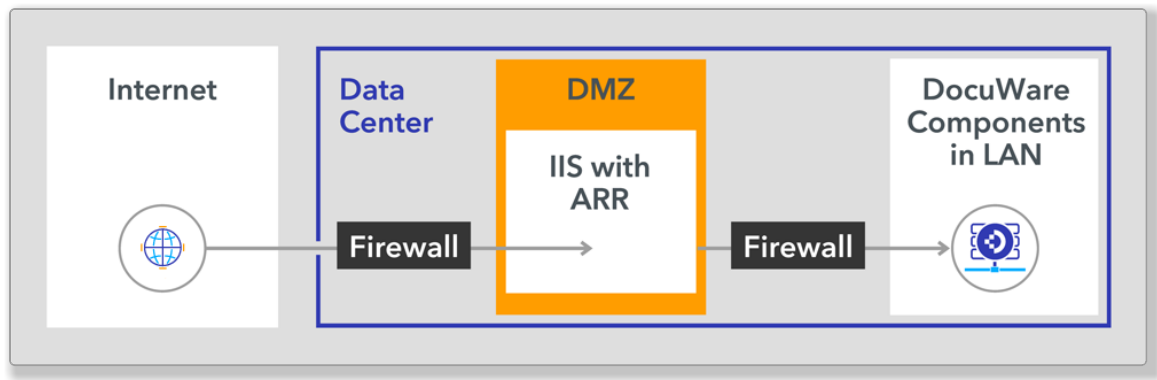
If you use a self-signed certificate, you must also ensure that your certification center is defined as a trusted certification center on all clients. To do so, import the certificate into the certificate store of all computer and user accounts in your domain, for example using a Group Policy Object (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](#) (page 60) section.





## 9 Additional components

### 9.1 Intelligent Indexing

Intelligent Indexing is an application that automatically detects the most important meta data from your scanned documents and suggests them as index entries. At the same time, the system learns with each process: If the system is familiar with a document type, suggested index words are automatically and reliably assigned. The user only has to confirm the suggestions or improve them. These confirmations or corrections automatically feed into the self-learning system, which can use this feedback to independently assign the index words after a brief learning period.

There are two different options for using Intelligent Indexing:

- **Intelligent Indexing as a cloud service**  
The Intelligent Indexing Service is a web-based service that is installed on Microsoft Azure and hosted by DocuWare. For more information, see the [White Paper Intelligent Indexing](#).
- **Intelligent Indexing as an on-premises module**  
You can also use Intelligent Indexing as a local application that is part of your DocuWare system.

### 9.2 Cloud service: Signature Service

For on-premises systems, the Signature Service is available as an add-on module that runs in the DocuWare Cloud environment.

With the [Signature Service](#) you ensure that your documents are signed in a workflow via a signature service provider.

For this, you need a license for the use of Workflow Manager. In addition, the signature certificates and a signature quota must be purchased. To use the Signature Service, an additional client license is required so that the service can log in to DocuWare.

The service is hosted by DocuWare. For more information, including on licensing and Signature service providers see the [White Paper Electronic signatures with DocuWare](#).

## 10 Connectors

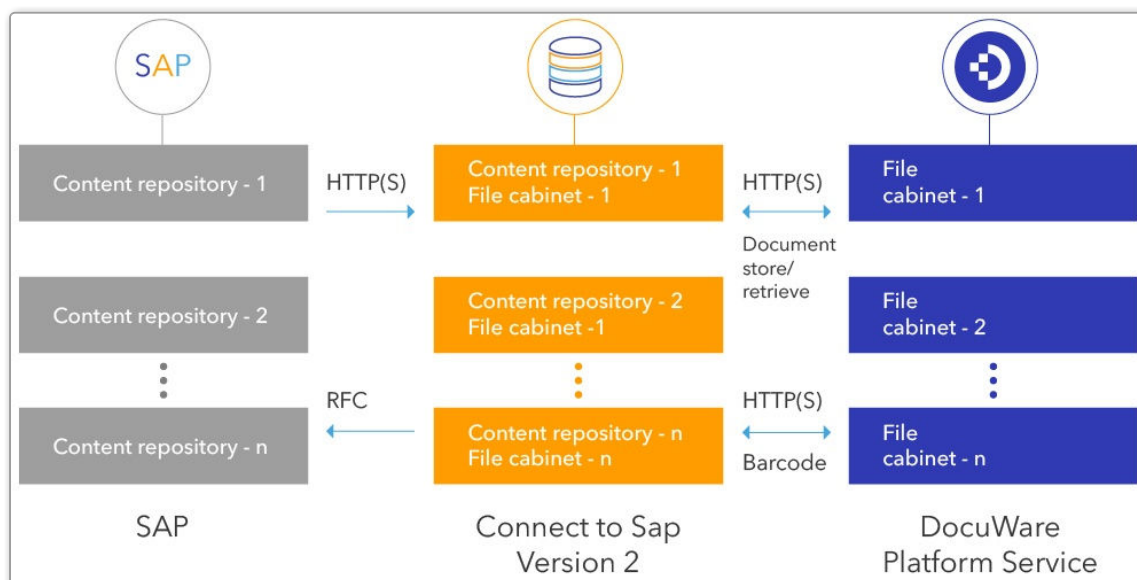
The web-based connectors connect the applications Connect to SAP, Version 2, and Connect to DATEV (German market only) with DocuWare.

### 10.1 Connect to SAP, Version 2

Connect to SAP, Version 2 extends SAP with functionalities for archiving documents and data, and uses DocuWare interfaces.

The SAP component ArchiveLink 4.7 is an OLE component facilitating scanning, viewing, and printing, as well as storing documents directly from the SAP interface. SAP controls the DocuWare Viewer using OLE automation to display the scanned document.

It works with extension modules developed by Varelmann Beratungsgesellschaft mbH. The connector module is not installed through DocuWare setup, but made available by DocuWare Professional Services as a separate application.



### 10.2 Connect to DATEV

With this component consisting of two different interfaces you extend your DATEV system with DocuWare. Connect to DATEV is only available for the German market.

- Connect to DATEV Rechnungswesen (ReWe)**  
 The interface automatically transfers the data entered in DocuWare. This happens during the invoicing process to DATEV ReWe as a posting batch via DATEVconnect or in EXTf format.
- Connect to DATEV Unternehmen Online (DUO)**  
 Using this interface, you upload the invoices scanned and archived in DocuWare to the DUO Web Portal

The Connect to DATEV Server is provided by DocuWare Professional Services.

## 11 Integration

DocuWare sets up its servers, web applications, and databases on the company's infrastructure. Software services take on different user administration tasks within DocuWare, from searching and document management to accessing databases and the file system. Communication with the DocuWare system is primarily conducted using the Platform Service. HTTPS-capable devices such as network printers and smartphones can also be used to access databases, servers, and programmed third-party applications via the Platform Service.

The individual integration options make various functions available for archiving, searching, synchronization, and importing. There are generally three integration options:

### Generic or universal integration

This group includes integration options for multiple programs or device types:

- DocuWare Printer (virtual printer driver)
- Monitored folder
- Smart Connect
- Autoindex (database synchronization)
- External select lists
- General Email
- DocuWare Scan app
- URL integration
- Log in to DocuWare using:
  - Microsoft Active Directory (NTLM)
  - Microsoft Azure Active Directory
  - Microsoft Active Directory Federations Services 4.0 (OpenID Connect)
- Encryption of the entire URL with passphrase with optional noise for highest security

### Connectors

They connect a specific software or specific device to DocuWare and enhance these external components with numerous document management functions. These connectors only work in combination with this one external component.

- Windows Explorer Client
- Local Data Connector (connecting to external database)
- Connect to Outlook
- Connect to DATEV Rechnungswesen (particularly for the German market)
- Connect to DATEV Unternehmen online (particularly for the German market)
- Connect to SAP, Version 2

For more information, see the "[Connectors](#)" chapter.

## Programming

Programming can be used to integrate individual DocuWare resources and create individual programs that provide extended DocuWare functionality in any third-party applications, via:

- URL integration
- Platform/Platform .NET API
- Validating index entries and form entries

The DocuWare "[Integration](#)" White Paper provides detailed information about all options for the web integration of applications in DocuWare.

## 12 Setup

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

### 12.1 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).

### 12.2 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.

The following components are installed with the Client Setup:

- DocuWare Administration  
DocuWare Administration can be used by regular users too, not just by administrators. It is therefore the only component available both in Client Setup and DocuWare Server Setup.
- User synchronization, Version 2
- Connect to Outlook
- DocuWare Desktop Apps
- DocuWare Update
- DocuWare Export
- Upload Service
- Windows Explorer Client (32- and 64-bit)
- Workflow Designer

## **DocuWare Update**

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.

## **Command-line interface for software distribution**

More information about this tool (Desktop Apps Silent Installation/Upgrade) can be found [here](#).

## 13 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.

### 13.1 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).

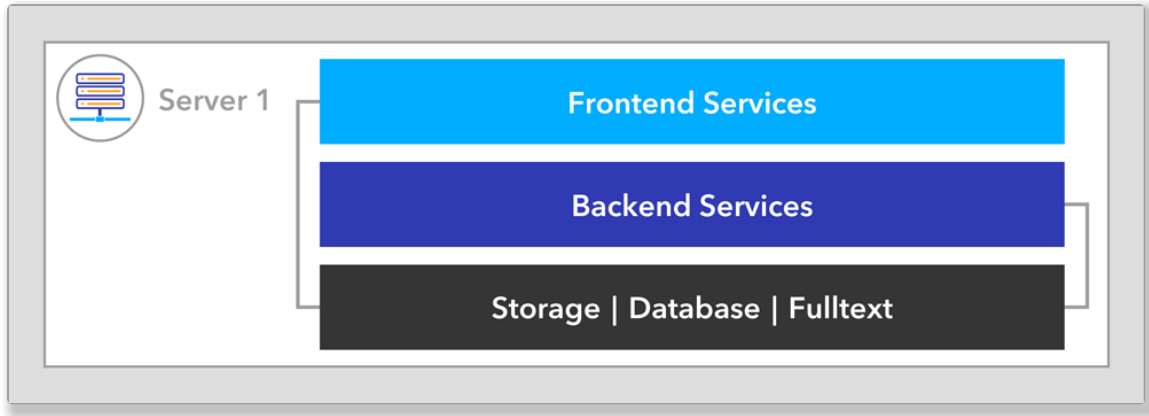
	XS	S	M	L	XL
<b>Users active at the same time: up to 50</b>	Yes	Yes			
<b>Users active at the same time: up to 250</b>		Yes	Yes		
<b>Users active at the same time: up to 500</b>			Yes	Yes	
<b>Users active at the same time: up to 1000</b>				Yes	Yes
<b>Users active at the same time: more than 1000</b>					Yes
<b>Fail Safety</b>			Yes	Yes	Yes



### 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).

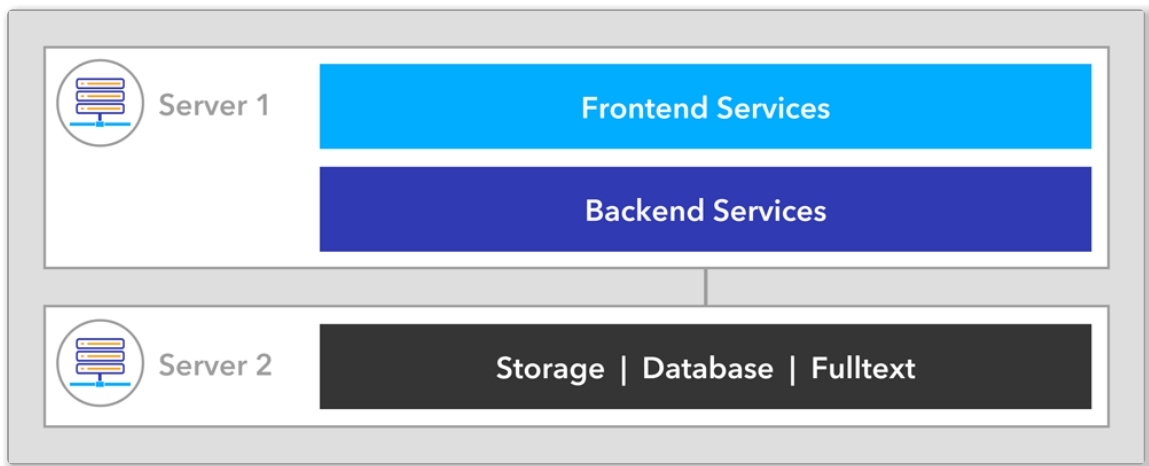


*DocuWare system on a server*

### 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.

The databases, the storage locations, and the full text functionality are installed on Server 3.

A load balancer is connected upstream of the complete DocuWare system. This can be installed on separate machines or on the front-end machines Server 1 and Server 2. The balancing can take place on Layer 7 (e.g. through Application Request Routing, ARR) or on Layer 4 (e.g. through Network Load Balancing Services, NLBS).

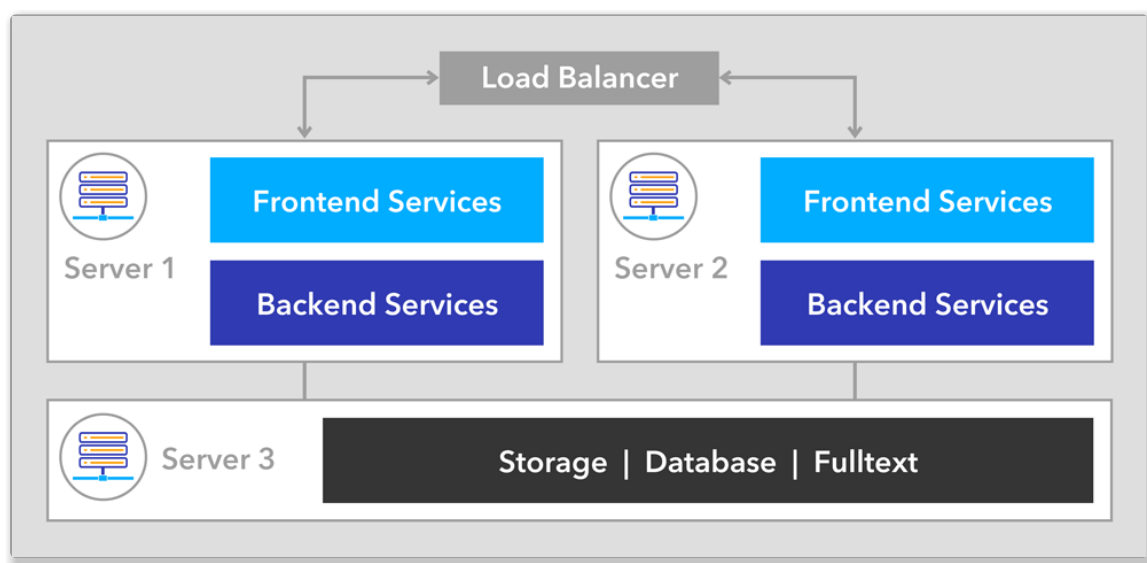
To ensure that Servers 1-3 work independently of each other and can also be restarted, all Authentication Servers work in "Local Mode." There is no further machine-to-machine communication.

To enable Local Mode, in the configuration file of each Authentication Server, add the value true to the element AuthenticationServerSettings as follows:

```
<DWConfig>
<AuthenticationServerSettings LocalServersOnly="true" />
</DWConfig>
```

Server 1 and Server 2 handle both user requests and background tasks. Therefore, the processing of user requests may be delayed if there are many background tasks (e.g. many incoming documents, rebuilding the full text).

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.

The databases, the storage locations, and the full text functionality are installed on Server 5.

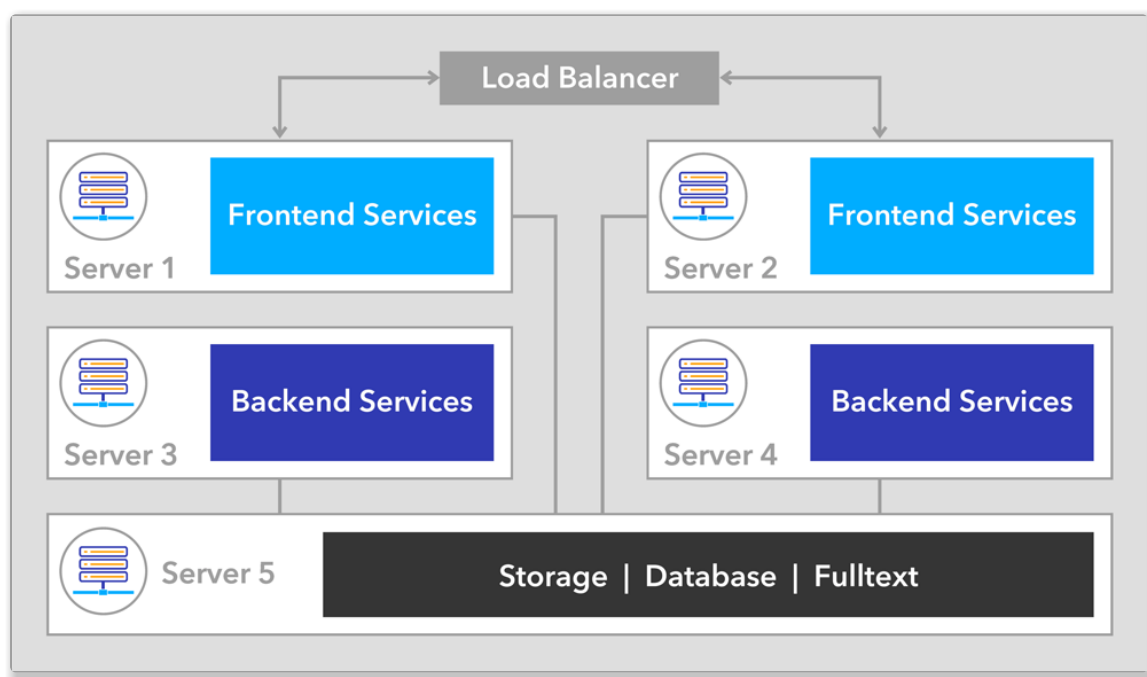
A load balancer is connected upstream of the complete DocuWare system. This can be installed on separate machines or also on the frontend machines Server 1 and Server 2. The balancing can take place on Layer 7 (e.g. through Application Request Routing, ARR) or on Layer 4 (e.g. through Network Load Balancing Services, NLBS).

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 inter-machine communication.

To enable Local Mode, in the configuration file of each Authentication Server, add the value "true" to the element AuthenticationServerSettings as follows:

```
<DWConfig>
<AuthenticationServerSettings LocalServersOnly="true" />
</DWConfig>
```

For this scaling form you need either an ENTERPRISE server license or two PROFESSIONAL server licenses.



### 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.

The databases, the storage locations, and the full text functionality are installed on Server 9.

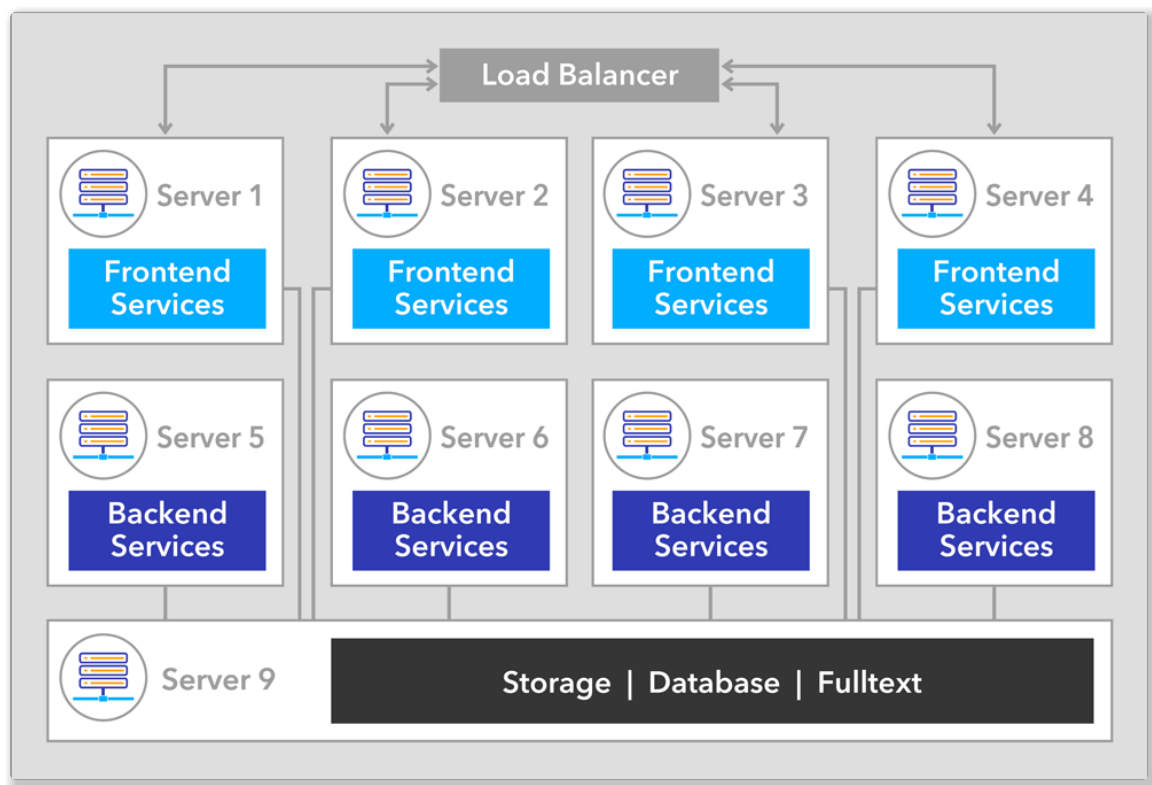
A load balancer is connected upstream of the complete DocuWare system. This can be installed on separate machines or also on the frontend servers 1-4. The balancing can take place on Layer 7 (e.g. through Application Request Routing, ARR) or on Layer 4 (e.g. through Network Load Balancing Services, NLBS).

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.

To enable Local Mode, in the configuration file of each Authentication Server, add the value true to the element AuthenticationServerSettings as follows:

```
<DWConfig>
<AuthenticationServerSettings LocalServersOnly="true" />
</DWConfig>
```

For this scaling form you need either two ENTERPRISE server licenses or four PROFESSIONAL server licenses.



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

## 13.2 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](#) (page 28).

## 13.3 Load balancing

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: Three different scenarios that address the most important causes are described below.

Three different technologies can be implemented for load balancing:

- Application Request Routing (ARR): this is an Internet Information Services (IIS) module from Microsoft that is installed separately upstream from the DocuWare system. The ARR module acts as a reverse proxy and distributes HTTP requests to underlying application servers. You can [download](#) the module from the Microsoft website.
- Network Load Balancing Services (NLBS): NLBS is a component of Windows Server. The idea is that various servers form a cluster. Machines acting as load balancers distribute the requests to the application servers based on TCP. You can find more information on the [Microsoft website](#).
- Hardware Load Balancer

In all three load balancing options, users should always be routed to the same server for performance reasons.

### 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](#) (page 61).

## 13.4 Availability and fail-safety

Most components can be installed multiple times in each DocuWare system for greater fail-safety.

The tasks of the Workflow Server are an exception: user synchronization, backup, and restore as well as synchronization of file cabinets (synchronization version 2). This will be changed with one of the next DocuWare versions.

Several Workflow Servers can be installed, but the workflows are assigned to fixed individual Workflow Servers. If a Workflow Server fails, the workflows must be manually configured for another server.

### Geographically dispersed systems

A geographically dispersed solution requires a lot of effort to implement and is therefore only recommended with the close support and guidance of DocuWare Professional Services.