

# AXIELL COLLECTIONS

TECHNICAL SPECIFICATIONS & ARCHITECTURE

# 1 Infrastructure specifications

The following is a compilation of important technical information for the Axiell Collections product suite. Please read through these topics carefully as they contain information that will affect the implementation and success of your project. This information is subject to change as Axiell releases new versions of its products. In general, Axiell Collections runs on all Windows platforms which are currently maintained by Microsoft including Windows 2012R2 Server and later. As a prerequisite for use, please install the most recent versions of the Windows Operating System, Microsoft Components and Features.

The Axiell Collections system may be installed on separate servers for all main components (separation of concerns), or on one (or more) combined servers. The recommended component implementation will depend on expected server load. Typically, the installed servers are virtualized. For more information on server specifications, please consult the Microsoft website.

## 1.1 MS SQL Server

Depending on the products implemented and your preferred configurations, technical requirements may vary. In addition, please consult the Microsoft web site for the minimum and recommended system requirements per MS operating system. Minimum and recommended system requirements for a server running a MS SQL Server Axiell Database are listed below. You may use an existing SQL Server installation in that case the recommended listed requirements are minimum and depending on the use of your other databases.

Part	Minimum system requirements	Recommended minimum requirements
Processor	4 (v)CPU	8 (v)CPU
RAM	8 GB	16 GB
Network card	1 Gbit	10 Gbit
Database Version <sup>1</sup>	SQL Server 2019	SQL Server 2022 or later
Disk space	50GB, but depending on collection size	Fast I/O disks recommended, 3 separate disks 100GB per disk

### 1.1.1 Considerations Regarding Disk Space and speed

Axiell Collections (empty database structure) and software: about 500 MB.

It highly depends on the amount of data you store per object and if you use record history, how large your DB file will grow. Average size Collections have around 50GB DB (mdf-file) and large collections can grow around 400GB.

Memory demand of the SQL server is hard to predict. Thumb rule is DB size + 30% + 8GB (for OS).

Regarding disk speed it is advised specifically for SQL Server Temp DB and Data to use fast storage like SSD.

Further best practice is to store TempDB, DATA- and LOG- files on different logical / physical drives. Note that TempDB is the most important database of your SQL Server installation,

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<sup>1</sup> Our products are supported for versions within [Microsoft's Mainstream Support](https://www.microsoft.com/en-us/support/mainstream-support)

therefor placing this on the fastest storage will give you the best performance. For more information on TempDB see also: <https://docs.microsoft.com/en-us/sql/relational-databases/databases/tempdb-database>

Regular maintenance of your SQL Server environment is important to keep the performance of Axiell Collections optimized. This means, Backups (also logfiles), Index Optimizations, Database Integrity checks, etc. It needs to be said that in case of Performance issues, often these requirements have not been met.

## 1.2 Axiell Collections and Axiell Internet Server

The Axiell Collections, Axiell Internet Server Application (AIS) and Axiell WebAPI require the latest Microsoft .Net framework installed and running on Microsoft IIS Platform that comes with the Microsoft OS. The resources needed for running these applications depends on usage and the number of applications. Please also consult the Microsoft webpage for hardware requirements regarding the usage of IIS.

In cases where the Axiell Internet Server is used for public access, it is installed on a server in the DMZ separate from the Axiell WebAPI. Access to API will normally be restricted only for the AIS. For Images and media, an Image Handler re-direction / url rewrite is advised.

Depending on performance requirements all Web Applications (AIS, WebAPI, Axiell Collections) can be installed on separate VM's.

Media files mostly take up the most disk space. These files need to be accessible for Collections. When the files are stored in a network Collections might need a service account to access the files. Having the media files on fast (enough) storage will improve loading.

The below requirements are (again) minimum specifications. If applied to Virtual Servers make sure you can raise the resources if needed.

Part	Minimum system requirements	Recommended minimum requirements
Processor	2 vCPU	4 vCPU
RAM	4 GB	8 GB
Network card	1 Gbit	10 Gbit
Operating System	Microsoft Windows Server 2019	Windows Server 2022 or later
Internet Information Services (IIS)	The version that comes with the OS	The version that comes with the OS
Microsoft .NET framework	version 4.8 or higher	version 4.8 or higher
Webdeploy (IIS)	3.6	3.6

## 1.3 Workstation requirements

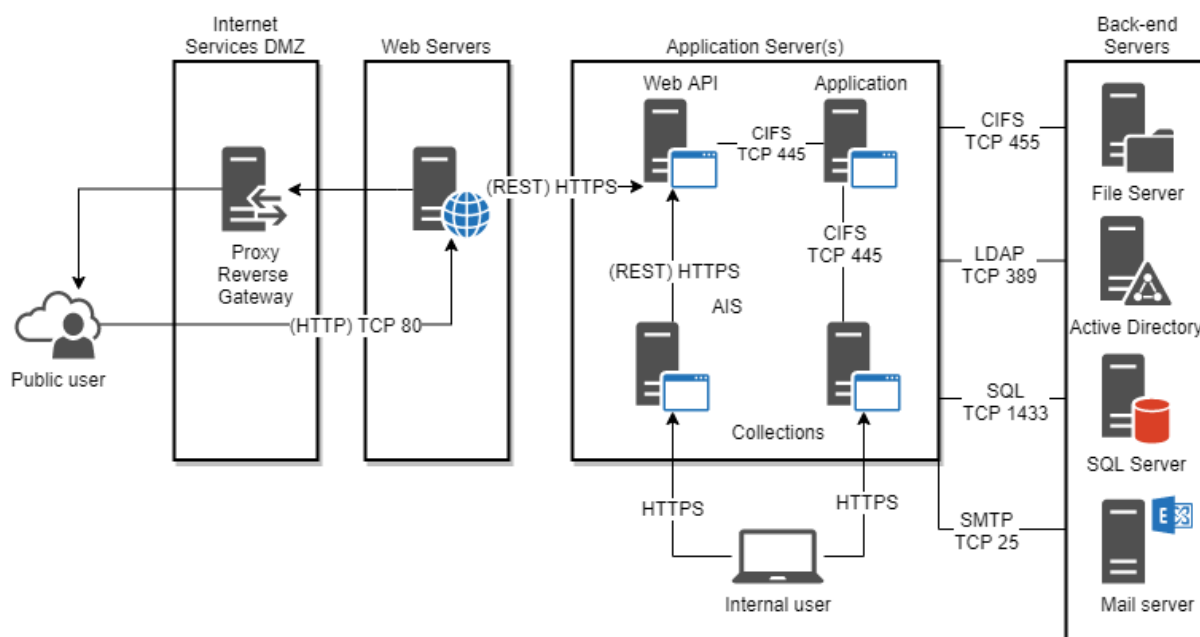
In the table below, minimum and recommended system requirements for client workstations are listed. Please consult the Microsoft web site for the minimum and recommended system requirements per Operating System. Apple workstations can be used for Axiell Collections or other browser-based applications. Up-to-date browser versions are recommended. Supported browsers: Edge, Chrome, Firefox and Safari.

To run the Axiell Designer Windows client you may need an RDP client to the Windows Application Server or run these clients in the local network. A fast VLAN (min 1Gbit) is required in that case.

Minimum requirements as listed below can be used when workstations are connected to an RDP server (Thin Clients).

Part	Minimum system requirements (suitable for RDP use)	Recommended minimum requirements
Processor	Quad Core	Quad Core
RAM	4 GB	8 GB
Screen resolution	1440 x 900	1920 x 1200 or higher
Network card	1 Gbit	10 Gbit
Operating System	Windows 10	Windows 11 or later
Microsoft Office (optional)	Office 2021	Office 365

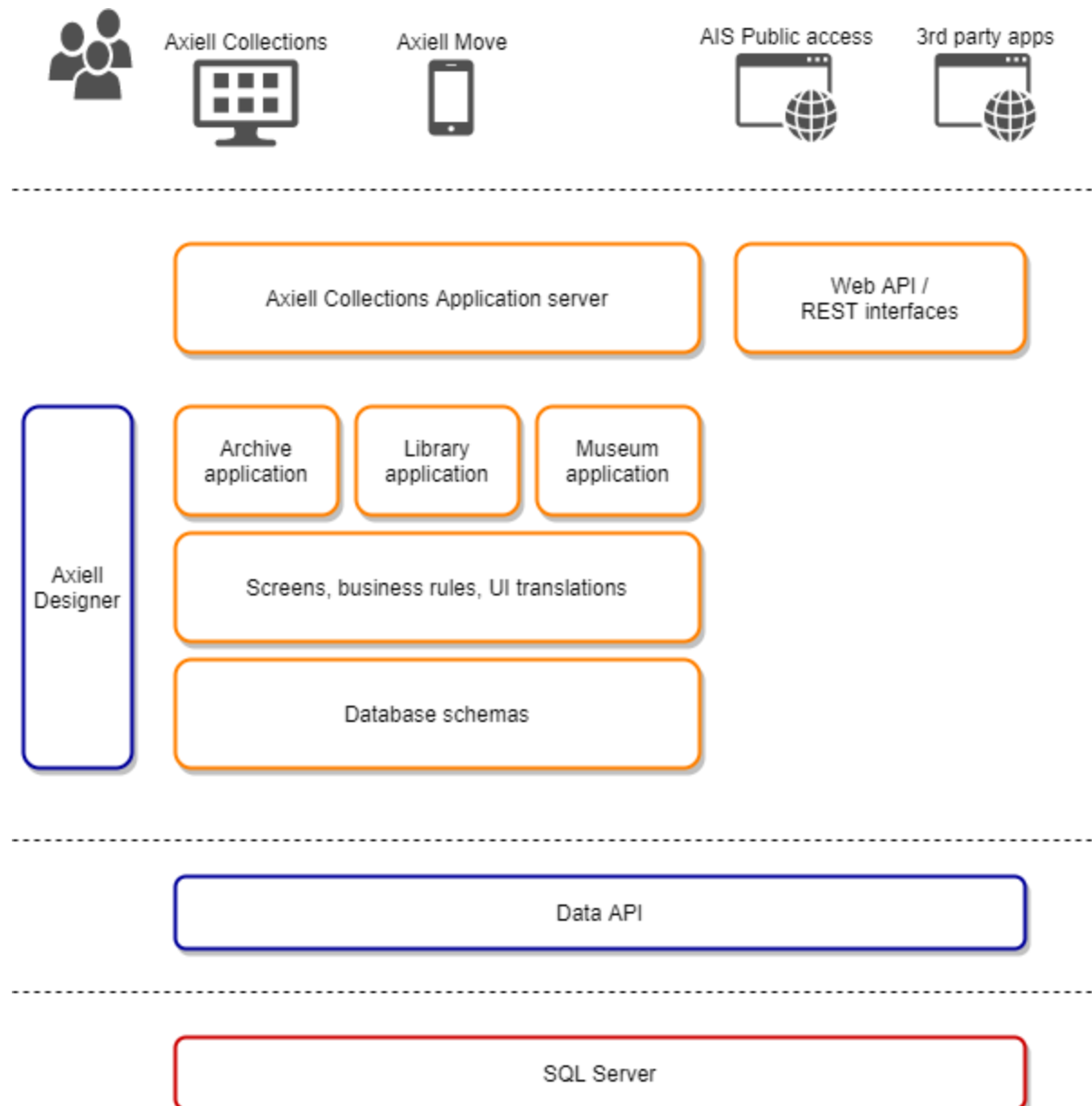
## 1.4 Infrastructural Overview



The Axiell Collections system may be installed on separate servers for all main components (separation of concerns), or on one (or more) combined servers. The recommended component implementation will depend on expected server load. Typically, the installed servers are virtualized. For more information on server specifications, please consult the Microsoft website.

## 2 System Overview

This section gives an overview of the logical architecture of the Axiell Collections system and its components. Axiell Collections Application Server and the Rest Interface are the webserver endpoints for the users. The configuration layer for Axiell Collections components (screens, business rules, data model) is configurable with Axiell Designer. A Data API software layer is responsible for all communication to the SQL Database.



## 3 Axiell Collections Architecture

The Axiell Collections solution consists of 4 distinct layers:

1. **User interface code that runs in the web browser.**

This code is the presentation and interaction layer and is written in Typescript, which is compiled into JavaScript. The layer communicates asynchronously with the application server over https.

2. **User interface code that runs in the application server.**

This code implements the logical “controls” that are rendered by the JavaScript layer in the browser and exposes them to the data API. The user interface has view and controller code.

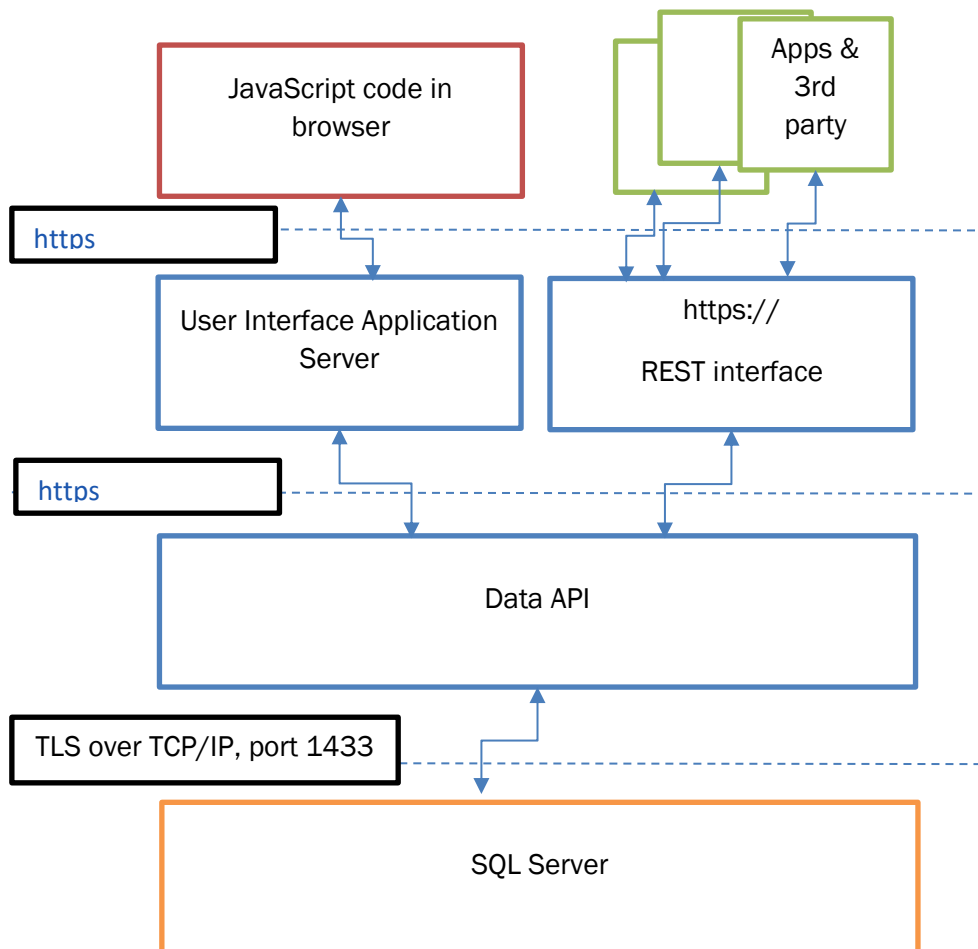
The user interface code is also responsible for state and session management. The user interface code uses the application settings / business logic that are defined in Axiell Designer to create the layout of forms and menus.

3. **Data API**

This layer receives Search and CRUD operations from the server User interface code and applies business rules to all data. The Data API serves the data, but it also guarantees that no unauthorized data reaches the application level. Furthermore, the Data API executes the Axiell Collection search language, Adapl scripting and the parametrization that is configured through the Axiell Designer tool. The Data API communicates through SQL with the database layer.

4. **Database layer**

This is a Microsoft SQL Server database instance with an Axiell Collections specific schema.



In addition, there is a REST Web API interface on top of the Data API. This allows third party products, or specialized applications, such as Axiell Office Connect, or Axiell Move to connect to the data using the same business rules as Axiell Collections itself. It is essential that this access flows through the Data API, since this is the only way that data integrity can be guaranteed if the data is accessed by external applications

The Java-script and App code runs on the user's device, the other 3 layers run on a server environment. These layers can run on a single server, on multiple separated servers, or on multiple application and data servers. The SQL server can be clustered. The exact server configuration is dependent on size and redundancy requirements.

The Java-script code is loaded by the browser from the server. No software installation (other than the browser, Edge, Firefox, Chrome or Safari) is required.

Mobile apps, like Axiell Move, but also third-party apps provide their own user interface and communicate over https with the Web API. Axiell apps are written using Xamarin and run natively on IOS devices.

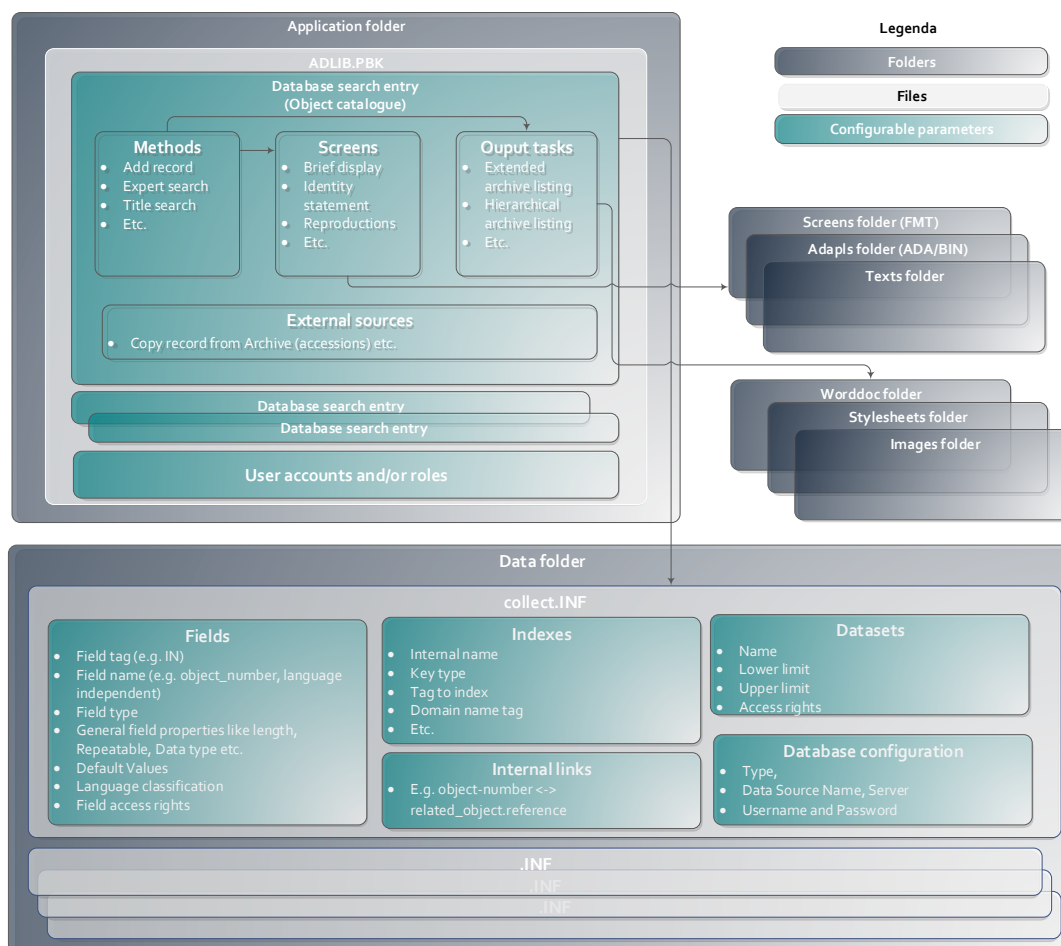
## 4 Administration & implementation

Axiell Designer is a comprehensive Windows based tool with a graphical user interface that enables the configuration, administration, and customization of the Axiell Collections system. It encompasses the following main tasks:

- Database maintenance: setup of tables, fields, relationships, indexing strategy
- Security maintenance: creation of roles, groups and access control lists to objects.
- Application maintenance: menu options, screen lay-out, output formats
- Import and export of data
- Adapl script editing and compilation
- Localization (including translations)

The application components are stored in a folder structure that is accessible to the software. Below is an overview of the relevant folders and their content. The components can be configured using Axiell Designer.

### APPLICATION CONFIGURABLE COMPONENTS



For backup and restore, the standard SQL Server tools are used (SQL Server Management Studio).



## 5 Security

The external clients are web browsers or IOS apps. These communicate over HTTPS to the User Interface Application Server and API server. If required, this can be over a VPN connection. By using https all data exchange on the outside world is encrypted.

The 4 layers can be separated by firewalls, allowing only the specific traffic and port that is required for the communication between the layers. User Interface & Application server and REST interface will be placed in a DMZ, allowing safe access from the Internet.

All interaction with the SQL database is performed in the Data API. The back interface is not exposed to the outside world. Furthermore, the connection to the SQL server can be encrypted. If required, the data in the SQL server can also be encrypted: this would make it impossible for even the SQL administrator to see legible data.

Authentication can be configured using Active Directory, LDAP, through a dedicated User database managed within Axiell Collections or using SSO (SAML/OAuth). Authorization is based on Groups that will be configured in the business engine. These groups will be mapped against AD Groups or User DB roles.