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System requirements

imc Learning Suite

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Content

1 Introduction

This document specifies the requirements that need to be in place for the client's installation environment, to enable them to run the platform under optimum conditions.

With regard to the supported system environments (operating system, middleware, hardware), imc AG prioritizes products with greatest market relevance and only tests versions for which an adequate period of support is guaranteed by the manufacturer. As a result, the systems specified in this document have been identified as being suitable for running the platform. Specifications other than those detailed are not supported by imc AG. As well as making product recommendations, this paper also includes dimensioning recommendations, resulting from a number of quality and load tests.

This document is aimed at decision-makers and IT professionals who are commissioned to install the system.

2 Supported System Components

Components	Product alternatives
Browser	– MS Internet Explorer 11 (not including compatibility modes) ⚠ **) – MS Edge version 88 – Mozilla Firefox version 78 Extended Support Release (ESR) – Google Chrome version 88 – Safari 10 on OS X (learner frontend only) – Mobile Browser Android > 4 and iOS > 9 (learner frontend only)
Application server*)	– Apache Web Server 2.4 with Apache Tomcat 9 and OpenJDK 8 or Oracle JDK 8***) – MS Internet Information Server 7/8/8.5 with Apache Tomcat 9, OpenJDK 8 or Oracle JDK 8***) and JK-Connector 1.2.21
Database server	– Oracle 18c (18.3) or 19c (19.3) JDBC driver ojdbc8.jar (version 18.3.0.0 or 19.3.0.0) – Microsoft SQL Server 2016, 2017, 2019 or Azure SQL JDBC driver mssql-jdbc-7.2.1.jre8.jar or mssql-jdbc-8.4.1.jre8.jar – PosgreSQL 11.3 or 12.4 JDBC driver postgresql-42.2.5.jar or postgresql-42.2.16.jar
Operating systems of application server	– Microsoft Windows 2012 – Microsoft Windows 2012 R2 – Microsoft Windows 2016 – Microsoft Windows 2019
Mobile apps system requirements	Android: – Minimum OS Version: 5.0 – Maximum OS Version: 9.0 iOS: – Minimum OS Version: iOS11 – Maximum OS Version: iOS14

*) New Architecture: Application server and JRE are already part of the delivery package.

) New Architecture: In the “Task Management Service” MS Internet Explorer 11 is **not supported.

***) Needs payed support.

Because there are frequent updates, fixes and new releases pertaining to the above-mentioned third-party products, it is not possible to test all combinations of these product versions. Their compatibility with each other therefore needs to be checked, if necessary, in the manufacturer's specific documentation.
The version details specified in the above table identify the system components supported by imc AG, for which support is also guaranteed. As a rule, later versions of these components can also be used to run the platform. However, because these versions have not been tested with the system, their use is the responsibility of and at the discretion of the client.

3 Dimension in hardware for Windows and Linux

This section gives recommendations for dimensioning hardware for using the system. The given values are to be considered additionally to the requirements of the operation system and application server.
The use of a separate application and database server is generally recommended.

3.1 Application server

Parameter	Recommended value
RAM	Minimum: 2.7 GB Java Heap for up to 150 parallel users Additional 1.7 GB Java Heap for each additional 100 parallel users For the new architecture: 25% more RAM Recommended: 8.0 GB
Hard drive storage	5 GB For Web server log files, min. 100 MB Additional storage is needed for media; a typical value is 100 GB
Processor	64-bit system, minimum 4 cores like Intel E5 Series 2600

3.2 Database server

Parameter	Recommended value
RAM	1 GB free RAM for database server Additional 100MB free RAM for each 100 parallel users For larger databases, memory space should be increased sufficiently to ensure a good DB cache hit rate (>90%) can be achieved.
Hard drive storage	Minimum 5 GB for the database
Processor	64-bit system, minimum 4 cores like Intel E5 Series 2600

3.3 Network requirements

Connection	Required bandwidth
Between application server and database server	Recommended: dedicated network connection, min 100 Mbit/s
Between application server and client PC	Minimum: 512 kbit/s per user (in parallel operation) Recommended: 100 Mbit/s (up to 1000 parallel users)

Please note that the actual network performance is affected by network components, such as authentication, proxy, encryption, anti-virus services or other filter services.

3.4 Client hardware requirements

Parameter	Recommended value
Minimal screen resolution	1280x1024 pixels (resp. 1280x800 pixels on a 16:9 display)
RAM	in a typical usage scenario at least 1.3 gigabytes of RAM must be available for the browser
Processor	Intel i3 processor or equivalent CPU

3.5 Tips

Processor performance required is geared to the number of "parallel" users, i.e. those users who can be logged on to the learning platform simultaneously and who can thus actively be working with the system. However, the total number of registered users in the database is of less importance for server dimensioning. CPU consumption also depends on the software components used (servlet engine, Web server, database server, JDBC driver) and their versions. The guidelines specified should thus only be taken as indications.

Please note that the guidelines for CPU and RAM are derived from typical behavior of platform users. Nevertheless, many administrative tasks in the system can be very hungry on CPU and storage resources and therefore should not be conducted when the system is already experiencing heavy demand.

The database will grow over time. In a system with 10,000 registered users and typical operation of the learning platform with 100 parallel users, you can expect the database to increase each year by at least 300 MB.

The disk requirement for media on the application server is geared to the number and size of media content managed: WBT and other media. Experience shows the disk requirement for media increases steadily over time.

A general observation is that typical user behavior on the learning platform varies from one client to another. It may be necessary to bear this fact in mind and ensure the availability of the above-mentioned standard values is relative to behavior.