ENGEMAN®

MAINTENANCE SOFTWARE

SOFTWARE AND HARDWARE REQUIREMENTS

05/2024 VERSION

1. VERSION HISTORY

VERSION	PUBLICATION	CHANGE LOG
05/2024	May/2024	✓ Update on the lifecycle of MSSQL 2016, Windows Server 2016, and Windows 10. ✓ Review of the Report Editor recommendations. ✓ Review of IIS compatibility. ✓ Review of general recommendations and minimum requirements for mobile devices compatible with Engeman® Mobile.
02/2024	February/2024	✓ Revision in compatibility with iOS and Android.
01/2024	January/2024	✓ Review on the compatibility with Oracle. ✓ Review on the compatibility with MSSQL Server.
10/2023	October/2023	✓ Technical Validity of the versions of Engeman®. ✓ Review of general compatibility recommendations with MSSQL Server and Oracle. ✓ Revision in compatibility with iOS and Android. ✓ Change in the nomenclature of the product, ceasing to use the term Client/Server (CS) and adopting Desktop. ✓ Report Editor now also requires MS .NET Framework 4.5.2. ✓ Included observations about custom Engeman® Mobile module
04/2023	April/2023	✓ Included link to this document on the official Engeman® website.
05/2022	May/2022	✓ Included security recommendations referent to ENGEMAN user. ✓ Review on Android compatibility. ✓ Review on iOS compatibility. ✓ Review on Oracle compatibility and recommendations. ✓ Included observations about driver ODBC 18 use for MS SQL Server. ✓ Review on MS IIS compatibility.

		✓ Included information about MS IIS lifecycle. ✓ Information about Engeman® Web (Intraweb) deprecation.
01/2021	January/2021	✓ Review on the iOS compatibility.
12/2020	December/2020	✓ Review on the compatibility and recommendations for MS Windows Server ✓ Review on the compatibility and recommendations with MSSQL Server.
07/2020	July/2020	✓ Review on the compatibility with MSSQL Server. ✓ Review on the general observations and recommendations for DBMS. ✓ Review on the compatibility with MS Windows. ✓ Review on the recommendations for MS Windows Server. ✓ Review on the compatibility with Internet Explorer browser. ✓ Review on the compatibility and recommendations for Android. ✓ Restriction of Android compatibility in environments with Firebird. ✓ Review on the iOS recommendations. ✓ Restriction of Engeman® Web (IntraWeb) compatibility with Engeman® Desktop.
01/2020	January/2020	✓ Review on the compatibility with Oracle. ✓ Review on the compatibility with MSSQL Server. ✓ Review on the compatibility with MS Windows Server. ✓ Review on the compatibility with MS Windows. ✓ Requirements for the new Engeman® Web. This product incorporates the Activity Posting, SSW and API modules.

2. SOFTWARE AND HARDWARE REQUIREMENTS FOR ENGEMAN® SOLUTION OPERATION

This description is intended to specify the software and hardware requirements necessary for the Engeman® solution to be fully and functionally used. We are limited to the recommendations specified in this document and do not validate, approve, evaluate, or suggest alternatives for configuring and sizing servers, workstations, or mobile devices, which is the exclusively responsibility of the customer and yours IT, infrastructure, and other teams.

Installation, configuration, and maintenance of: Engeman® DBMS and database (production or QA/test), operating system, network, and any additional infrastructure other than the Engeman® system itself, are exclusive responsibilities of the customer. Our teams will not be able to perform any installation, configuration, and maintenance service other than Engeman® software.

Compatibility with operating systems or database managers that have their life cycle and support terminated by their respective manufacturers is not guaranteed, even as specified herein.

> The latest version of this document will be available for reference and download at https://engeman.com/en/engeman-hardware-and-software-requirements.
>
> In case of any discrepancies between the version published on the website and this document, the most recent version shall prevail.

DBMS APPROVED FOR ENGEMAN® SOLUTION AND GENERAL RECOMMENDATIONS

The Engeman® solution, its modules, and other products, including those already discontinued (Engevendas and others) are only compatible with Microsoft SQL Server and Oracle Database Management Systems (DBMS). It is up to the client and responsible DBA to define the licensing and edition adopted.

We recommend careful evaluation when adopting free, "Express", "beta" or "developer" editions of both DBMS due to their restrictions, such as the use of processors, memory,

and storage. Be aware of the database size limit in "Express" versions, which will cause the Unavailability of the Engeman solution when reached.

Our recommendation criteria avoid versions that have an end of the manufacturer's life cycle and support of less than one year.

Versions in this condition are highlighted in the compatibility table.

DBMS	32 Bits	64 Bits	Patch/Service Pack	Recommended
SQL Server 2014	✅	✅	Service Pack 3 - **End of the manufacturer's life cycle in July'24**.	⛔
SQL Server 2016	n/a	✅	Service Pack 3 - **End of the manufacturer's life cycle in July'26**.	⚠️
SQL Server 2017	n/a	✅	Latest Cumulative Update	✅
SQL Server 2019	n/a	✅	Latest Cumulative Update	✅
SQL Server 2022	n/a	✅	Latest Cumulative Update	✅
Oracle 19c	n/a	✅	Latest Cumulative Update	✅
Oracle 21c	n/a	✅	Latest Cumulative Update	✅
Oracle 23c	n/a	⛔	**Available to on-premises by Oracle starting 2H CY2024.** **Wait to our evaluation.**	⛔

⚠️ Pay attention to the end of the life cycle.

Manufacturer Support Schedule Information

MSSQL

https://support.microsoft.com/en-us/help/4047326/support-policy-for-microsoft-sql-server

Oracle

https://www.oracle.com/support/lifetime-support/resources.html

The character encoding, **Collation** for MS SQL Server and **Character Set** for Oracle, must follow the recommendations of the table below to ensure the correct operation of the Engeman® solution.

DBMSs	Character Encoding
SQL Server	SQL_Latin1_General_CP1_CI_AI
Oracle	WE8ISO8859P1

(a) Using Oracle requires permission in v$database view for the Engeman® database related user.

```
GRANT SELECT ON v$database to [USER]
```

(b) Using SQL Server requires the installation of the latest published ODBC driver from Microsoft, available for reference at the address below.

https://docs.microsoft.com/en-us/sql/connect/odbc/windows/microsoft-odbc-driver-for-sql-server-on-windows

Optionally, under the responsibility and validation of the customer's MSSQL DBA, other compatible connection drivers officially available from Microsoft may be used.

Important: (1) The Engeman® configuration file (Engeman.INI, for example) must include the driver parameter, so that the connection is always made using the correct version of the SQL Server ODBC driver. Without this parameter, the connection may eventually use other versions that are installed on Windows.

```
driver=<latest version of ODBC Driver for SQL Server>
```

[Example]: `driver=ODBC Driver 18 for SQL Server`

By specifying the incorrect driver, the following error message will be displayed at Engeman® startup. The solution is to verify the installed driver version and if the parameter in Engeman® configuration file is described correctly.
[Error Message] Unable to connect to database
Data source name not found and not default driver specified

  (2) Both the installation of the latest version of the ODBC driver and the configuration of the Engeman® configuration file (Engeman.INI, for example) should be applied to all workstations where Engeman® Desktop has access.

(3) The ODBC driver for SQL server, at version 18 or higher, requires the inclusion of the parameter *encrypt=no* at Engeman's configuration file (Engeman.INI, for example). The absence of this parameter leads to the error message below:

[Error Message] "It has not been possible to consult the database. [FireDAC] [Phys] [ODBC] [Microsoft] [ODBC Driver 18 for SQL Server] SSL Provider. The certificate chain was issued by an authority that is not trusted."

Technical reference for the issue: https://techcommunity.microsoft.com/t5/sql-server-blog/odbc-driver-18-0-for-sql-server-released/ba-p/3169228

(4) For information about MS IIS lifecycle consult Internet Information Services (IIS) - Microsoft Lifecycle | Microsoft Docs.

The recommended hardware requirements for DBMS server are:

Users	Processor	Physical Processors	Cores	RAM Memory	
				Minimum	Recommended
Up to 5	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	4 GB	6 GB
Up to 10	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	4 GB	8 GB
Up to 20	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	8 GB	12 GB
Up to 50	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	12 GB	20 GB
Up to 100	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz,) or equivalent.	4	8	20 GB	32 GB
Up to 200	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz,) or equivalent.	8	12	36 GB	44 GB
Up to 300	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz,) or equivalent.	8	16	44 GB	52 GB

Note: From 101 users onwards, we recommend a specific assessment of the usage scenario by the vendor, manufacturer/developer, or DBA responsible for DBMS administration to more assertively validate and scale features.

For best read/write performance, we recommend using a 10,000 RPM or higher SAS disk.

The settings specified refer to the services related to Engeman® solution only. In addition to these, the Operating System requirements or other solutions that share the same server must be added.

We recommend a network monitoring politics to ensure:

- Delay under 3 ms.
- Package loss under 1%.

PAY ATTENTION

(i) To use the Engeman® Desktop, observe the recommended architecture where database and executable should work on the same data network for better performance. Migrating the database to cloud services or external servers, accessed directly or through VPN, keeping the executable installed locally is not indicated and will present a drop in performance due to latency. In this scenario, we recommend migrating the entire environment, adopting remote access to the software or hiring Engeman® Cloud, our cloud hosting service.

(ii) We recommend, especially when access to Engeman® and its modules is exposed on the internet, the inactivation or exchange of the default password of the ENGEMAN user for another one of greater complexity. This user is created by default during the installation of the system and has all the administrative privileges that, in an improper access, can compromise the data and access to the system.

Technical Validity – Engeman® Versions

The technical validity period for Engeman® software versions and all its modules is considered to be a maximum of 5 years from the date of their release. The versions and their release dates can be obtained from https://engeman.com.br/news.html.

3. ENGEMAN® DESKTOP

To use Engeman® Desktop, the following Operating Systems are approved:

Operating Systems	32 Bits	64 Bits	Recommended
Windows 10 (Except Home Edition) **– End of the manufacturer's life cycle in Oct'25.**	✓	✓	⊖
Windows 11 (Except Home Edition)	n/a	✓	✓
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✓	⚠
Windows Server 2019	n/a	✓	✓
Windows Server 2022	n/a	✓	✓

⚠ Attention regarding the end of the lifecycle.

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

The recommended hardware requirements for a workstation that will run Engeman® Desktop are:

Processors	Physical Requirements	Cores	RAM Memory	
			Minimum	Recommended
32 or 64 bits, 3M Cache, 3.2 GHz or equivalent.	1	2/4	2 GB	4 GB

The settings specified refer to Engeman® Desktop only. In addition to these, the Operating System requirements or other solutions that share the same workstation must be added. As for the disk space required for application installation, it is recommended to have at least 500 MB.

We recommend a network monitoring politics to ensure the following parameters for database server access:

- Delay under 3 ms.
- Package loss under 1%

8

4. ADVANCED REPORT EDITOR (DESKTOP)

To use the Advanced Editor, the following Operating Systems are approved:

Operating Systems	32 Bits	64 Bits	Recommended
Windows 10 (Except Home Edition) **– End of the manufacturer's life cycle in Oct'25.**	✓	✓	⊖
Windows 11 (Except Home Edition)	n/a	✓	✓
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✓	⚠
Windows Server 2019	n/a	✓	✓
Windows Server 2022	n/a	✓	✓

⚠ Attention regarding the end of the lifecycle.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

The recommended hardware requirements for a workstation that will run the Advanced Editor are:

Processor	Physical Processors	Cores	RAM Memory	
			Minimum	Recommended
32 or 64 bits, 3M Cache, 3.2 GHz or equivalent.	1	1/2	2 GB	4 GB

The settings specified refer to running Engeman® and Advanced Report Editor only. In addition to these, the Operating System requirements or other solutions that share the same workstation must be added.

These requirements consider the official Engeman standard reports package. Custom reports, whether by the customer or Engeman, may require additional resources depending on the manipulated data, such as high-resolution images.

To use the Advanced Report Editor module, it is necessary for the workstation/server to have Microsoft .Net Framework 2.0, 3.0, 3.5, 4.5, and 4.5.2.

To use the Dashboards module, it is necessary for the workstation/server to have Edge.

9

5. ENGEMAN® DESKTOP – WTS TERMINAL SERVICE / REMOTE APP

To use Engeman® Desktop for remote access, the following Operating Systems are approved:

Operating Systems	32 Bits	64 Bits	Recommended
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✅	⚠️
Windows Server 2019	n/a	✅	✅
Windows Server 2022	n/a	✅	✅

⚠️ Attention regarding the end of the lifecycle.
Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

The recommended hardware requirements for a WTS server that will run Engeman® Desktop are:

Users	Processors	Physical Processors	Cores	RAM Memory	
				Minimum	Recommended
Up to 5	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	3 GB	4 GB
Up to 10	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	4 GB	6 GB
Up to 20	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	4 GB	8 GB
Up to 50	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	8 GB	16 GB
Up to 100	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	4	8	16 GB	24 GB
Up to 200	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	8	12	28 GB	44 GB

Up to 300	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	8	16	44 GB	52 GB

Note: From 101 users onwards, we recommend a specific assessment of the usage scenario by the vendor, manufacturer, or those responsible for administering the remote access solution used to be more assertively validate and scale features.

For best read/write performance, we recommend using a 10,000 RPM or higher SAS disk.

The settings specified refer to running Engeman® Desktop only. In addition to these, the Operating System requirements or other solutions that share the same server must be added.

We recommend a network monitoring politics to ensure the following parameters:

- Delay under 3 ms.
- Package loss under 1%

6. ENGEMAN® WEB

To use Engeman® Web, activity posting module, SSW or API, the following Operating Systems are approved:

Operating Systems	32 Bits	64 Bits	Recommended
Windows 10 (Except Home Edition) **– End of the manufacturer's life cycle in Oct'25.**	✅	✅	⛔
Windows 11 (Except Home Edition)	n/a	✅	✅
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✅	⚠️
Windows Server 2019	n/a	✅	✅
Windows Server 2022	n/a	✅	✅

⚠️ Attention regarding the end of the lifecycle.

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

To publish the webservices, one of the following versions of Internet Information Service can be used:

IIS Server	32 Bits	64 Bits	Patch	Recommended
IIS 10	✅	✅	-	✅

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) Internet Information Services (IIS) is a component of the Windows operating system and follows the same lifecycle as this OS.

Browsers approved for use with Engeman® Web, activity posting module or SSW are:

Browsers	32 Bits	64 Bits	Patch	Recommended
Chrome	✅	✅		✅
Edge	✅	✅	Latest	✅
Firefox	✅	✅		✅

Note: Engeman® Web, activity posting module or SSW requires Javascript enabled in your browser.

For better security, it is recommended to use the latest browser versions except beta releases or development releases.

The recommended hardware requirements for Internet Information Service server that will host the Engeman® Web, activity posting module, SSW or API application publication are:

Users	Processor	Physical Processors	Cores	RAM Memory	
				Minimum	Recommended
Up to 5	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	4 GB	8 GB
Up to 10	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	6 GB	10 GB
Up to 20	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	10 GB	14 GB
Up to 50	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	20 GB	24 GB
Up to 100	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz,) or equivalent.	4	8	32 GB	42 GB

Note: From 101 users onwards, we recommend a specific assessment of the usage scenario by the vendor, manufacturer, or those responsible for administering the remote access solution used to be more assertively validate and scale features.

Engeman® Web, activity posting module, SSW or API requires the installation/activation of:

- MS ASP.NET Core Hosting Bundle 2.2
- MS .Net Framework 4.0 or higher
- .NET Core Runtime

13

The settings specified refer to running Engeman® Web, activity posting module, SSW or API only. In addition to these, the Operating System requirements or other solutions that share the same server must be added. As for the disk space required for application publication, it is recommended to have at least 900 MB.

The good performance of the application is directly influenced by the communication between its webservices and the DBMS. To do this, we suggest that this latency is close to 3 ms and that the packet loss is less than 1%.

Engeman® Web, activity posting module, SSW and API are only compatible with versions of Engeman® Desktop 10.0.0.0 or higher and reports of Current Engine. To consult Engine and its reports, access Processes > Report Editor and check the field "Engine". In case it has reports at this format that are essential for Engeman® operation, request a conversion proposal with our technical support before proceeding the update.

7. ENGEMAN® SSW (.net)

To use Engeman® SSW.net, the following Operating Systems are approved:

Operating Systems	32 Bits	64 Bits	Recommended
Windows 10 (Except Home Edition) **– End of the manufacturer's life cycle in Oct'25.**	✅	✅	⛔
Windows 11 (Except Home Edition)	n/a	✅	✅
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✅	⚠️
Windows Server 2019	n/a	✅	✅
Windows Server 2022	n/a	✅	✅

⚠️ Attention regarding the end of the lifecycle.

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

To publish the webservices, one of the following versions of Internet Information Service can be used:

Web Server	32 Bits	64 Bits	Patch	Recommended
IIS 8	✅	✅	-	⛔
IIS 8.5	✅	✅	-	⛔
IIS 10	✅	✅	-	✅

⚠️ Pay attention to the end of the life cycle.
Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) Internet Information Services (IIS) is a component of the Windows operating system and follows the same lifecycle as this OS.

Browsers approved for use with Engeman® SSW.net are:

Browsers	32 Bits	64 Bits	Patch	Recommended
Chrome	✅	✅		✅
Edge[1]	✅	✅	Latest	✅
Firefox	✅	✅		✅

Note: Engeman® SSW.net requires JavaScript enabled in your browser.

For better security, it is recommended to use the latest browser versions except beta releases or development releases.

[1] Microsoft recommends the immediate adoption of Edge browser, even offering an exclusive mode of compatibility with Internet Explorer. For more detail, see:

https://docs.microsoft.com/pt-br/lifecycle/faq/internet-explorer-microsoft-edge#what-if-my-enterprise-line-of-business-lob-application-has-a-dependency-on-a-version-of-internet-explorer-that-reached-end-of-support

The recommended hardware requirements for Internet Information Service server that will host the Engeman® SSW.net application publication are:

Users	Processor	Physical Processors	Cores	RAM Memory	
				Minimum	Recommended
Up to 5	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	3 GB	4 GB
Up to 10	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	4 GB	6 GB
Up to 20	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	6 GB	8 GB
Up to 50	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	12 GB	16 GB
Up to 100	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz,) or equivalent.	4	8	20 GB	26 GB

Note: From 101 users onwards, we recommend a specific assessment of the usage scenario by the vendor, manufacturer, or those responsible for administering the remote access solution used to be more assertively validate and scale features.

The settings specified refer to running Engeman® SSW.net. In addition to these, the Operating System requirements or other solutions that share the same server must be added.

To have better server and application performance, better availability and better security, if the system is installed to run via IIS, it is recommended to create a separate application pool for every 50 users who will be accessing the system.

As for the disk space required for application publication, it is recommended to have at least 250 MB.

The good performance of the application is directly influenced by the communication between its webservices and the DBMS. To do this, we suggest that this latency is close to 3 ms and that the packet loss is less than 1%.

8. ENGEMAN® MOBILE

To install Engeman® Mobile app, the following mobile Operating Systems are homologated:

Operating Systems	Recommended
Google Android[1,2]	
Android 5	⛔
Android 6	⛔
Android 7	⛔
Android 8	⛔
Android 9	⛔
Android 10	⚠️
Android 11	⚠️
Android 12	✅
Android 13	✅
Android 14	✅
Apple iOS[3]	
iOS 11	⛔
iOS 12	⚠️
iOS 13	⚠️
iOS 14	✅
iOS 15	✅
iOS 16	✅
iOS 17	✅
Microsoft Windows (UWP)	
Windows 10, except Home Edition [UWP] **– End of the manufacturer's life cycle in Oct'25.**	⚠️
Windows 11, except Home Edition [UWP]	✅
Windows – Kiosk Mode	⛔

⚠️ Pay attention to the end of the life cycle. We recommend only versions published in the last five years and indicate caution with those that are more than three years old.
⛔ For versions released more than five years ago, there is no guarantee of compatibility. Windows Kiosk mode is not supported in the mobile UWP.

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

> Engeman® Mobile app compatibility with Mobile Operating Systems may change without notice, considering that manufacturers do not have public lifecycle policies for these features.

> For adjustments, corrections and/or improvements to the custom Engeman® Mobile module, it is necessary and is a prerequisite that it be updated to the latest version available, since most adjustments are first made in the standard app before being consolidated into the custom app. After the Engeman Mobile Module update is available, to apply it, the Engeman® Desktop module must also be updated to the latest version, so that the database structure changes necessary for the operation of the Engeman® Mobile module are also applied.

To install Engeman® Mobile webservices, the following Operating Systems are homologated:

Operating Systems	32 Bits	64 Bits	Recommended
Windows 10 (Except Home Edition) **– End of the manufacturer's life cycle in Oct'25.**	✅	✅	⛔
Windows 11 (Except Home Edition)	n/a	✅	✅
Windows Server 2016 **– End of the manufacturer's life cycle in Jan'27.**	n/a	✅	⚠️
Windows Server 2019	n/a	✅	✅
Windows Server 2022	n/a	✅	✅

⚠️ Attention regarding the end of the lifecycle.

Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) To use the Dashboards module, the workstation/server must have Edge.

Information regarding support lifecycle
https://learn.microsoft.com/en-us/lifecycle/products/?terms=windows%20server

To publish the webservices, one of the following versions of Internet Information Service can be used:

Web Server	32 Bits	64 Bits	Patch	Recommended
IIS 10	✅	✅	-	✅

⚠ Pay attention to the end of the life cycle.
Note: (i) To use the Advanced Report Editor module, the workstation/server must have Microsoft.Net Framework 2.0, 3.0, 3.5, 4.5 and 4.5.2.
(ii) Internet Information Services (IIS) is a component of the Windows operating system and follows the same lifecycle as this OS.

The recommended hardware requirements for Internet Information Service server that will host the Engeman® Mobile webservices publication are:

Users	Processor	Physical Processors	Cores	RAM Memory	
				Minimum	Recommended
Up to 5	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	1	2	2 GB	3 GB
Up to 10	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	3 GB	4 GB
Up to 20	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	4 GB	6 GB
Up to 50	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	2	4	6 GB	8 GB
Up to 100	Intel® Xeon® (64 bits, 8M Cache, 3.0 GHz) or equivalent.	4	8	8 GB	16 GB

From 101 devices onwards, we recommend a specific assessment of the usage scenario, especially for predicting simultaneous syncs and characteristics of synchronized data (images, files, videos, etc.) that may consume larger amounts of memory. Our suggestion is to consider consumption of 100 to 150 MB per device in this case, but we recommend that the provider or infrastructure professional be consulted in this high demand scenario.

The recommended hardware requirements for the mobile device running Engeman® Mobile are:

Operating Systems	Storage		Memory	
	Minimum	Recommended	Minimum	Recommended
Android	512 MB	1 GB	4 GB	8 GB
iOS			2 GB	4 GB
UWP	1 GB	2 GB	4 GB	8 GB

- ⚠️ These specifications consider a scenario of the standard application, configuring up to 5 (five) branches and synchronizing an average of 50 work orders to the device. The size of the local database (device) and synchronization time are directly related and grow proportionally with the data volume. Customizations and handling of attachments with high-resolution photos or videos will impact performance and may require additional memory and storage. Consider other applications running concurrently and the operating system's own consumption.

⚠️ Functionalities such as **attaching files** or **sending observations on plans and applications**, enabled on Engeman Desktop, require significantly higher hardware requirements.

The settings specified refer to running Engeman® Mobile only. In addition to these, the Operating System requirements or other solutions that share the same server must be added.

To ensure server and application performance and availability parameters, it is recommended that you create an individual application pool on IIS for groups of 30 to 40 users/devices that will be accessing the system. In scenarios with high demand for synchronization (number of records vs. reduced sync interval) of Work Orders/Service Requests, it is recommended that this amount be adjusted for groups of 20 to 30 users/devices in each application pool on IIS. Using the app to sync across low quality

3G/4G/5G phone networks (unstable, slow speed, access restrictions, etc.) may require that connection pools on IIS be shared by even smaller groups of users/devices.

The mobile devices for Engeman® Mobile installation must have the following characteristics:

- Engeman® Mobile in environments using the DBMS Firebird is only compatible with versions of Engeman® Desktop 8.6.1.4 or lower. As of this version, it is necessary to migrate to an approved DBMS. Contact our commercial department to evaluate the migration.

- [Windows] The application installation process requires credentials from a user with an administrative profile.

[1] Engeman® Mobile compatibility is guaranteed for use on devices with official Android distributions, that is, those officially released by Google or authorized manufacturers that have not been discontinued.
Versions that have been modified ("root") not approved by Google and manufacturers are not approved and may have incompatibility that makes the use of the application unfeasible.
Check with your device manufacturer about compatibility with the latest versions of Android.

[2] We recommend paying attention to all customers using Android versions 10 or prior on their mobile devices to evaluate the update as a priority due to the imminent end of the compatibility cycle with new versions of Engeman® Mobile and Engeman® Desktop.

[3] Due to restrictions imposed by the manufacturer for publishing applications on its platform (*AppStore*©) we recommend attention to the need to update iOS to the latest versions compatible with the devices in use. If iOS update support is not available for these devices, there is a risk that newer versions of Engeman® Mobile will behave unexpectedly in this scenario. The latest iOS compatibility with your device can be found at https://www.apple.com/ios/whats-new.

Scanning QRCode or any other barcode pattern on smartphones is emulation through the device's camera. The efficiency and scanning compatibility in this scenario are directly related to camera quality, adjustments made to the Operating System by the device manufacturer and, ultimately, to the print quality that will be scanned. Poor quality cameras scanning codes with reduced dimensions tend to be less efficient. 'Less efficient' means the way the scanning is performed, but the device needs good

22

stabilization, proximity to the printed code, good lighting conditions and code printing needs to be of good quality/condition. Code scanning is the sole responsibility of the device Operating System and not of Engeman® Mobile. For this reason, no intervention can be done in our app to improve the code scanning action.

9. Discontinued Products and Features

Engeman® Web (Intraweb), Engevendas® and Engesynchron® have been discontinued and are not compatible with Engeman® Desktop 8 or later versions. Before upgrading Engeman® Desktop to newer versions, **consult technical support for guidance if you have these modules in use**.

As of February 2015, the Old Engine (Old Report Editor) has been discontinued. Reports from this Engine only can be viewed (not edited) in recent versions of Engeman®, a feature that may be discontinued without notice due to technical development issues and restrictions.

Maintenance of the standard report package is performed only in the Current Engine (Advanced Report Editor). We do not provide any type of maintenance (development, improvement, correction, or layout adjustments) in Old Engine reports, even if the report is standard or customized by Engeman® company. In these cases, we recommend the use of the updated standard report package for the Current Engine or request a commercial proposal for conversion of the reports.

10. GENERAL NOTES

> We strongly recommend the use of unique DBMS authentication accounts to connect to the database for each service used in the Engeman® deployment.

Example:

- When using Engeman® Desktop, Engeman® Mobile, Web with SSW and API modules, NewEngRegras:
  - ENGEMAN_DESKTOP to authenticate Engeman® Desktop to the stations or WTS.
  - ENGEMAN_MOBILE to authenticate the mobile data sync webservice.
  - ENGEMAN_REGRAS to authenticate the webservice to integration or business rule execution service.
  - ENGEMAN_WS to authenticate webservices from integration with other software.
  - ENGEMAN_API to authenticate the Engeman API webservice.
  - ENGEMAN_WEB to authenticate the Engeman Web RESTful API webservice.
  - ENGEMAN_SSW to authenticate the SSW webservice.

- Exporting to MS-Project is available only in Engeman® Desktop and requires that MS-Project is installed and licensed locally (or on the remote host) to complete this action. Installation, licensing, and maintenance of MS-Project are the sole responsibility of the customer. If it is not possible to install it, as of version 11.2.0.5 of Engeman® Desktop it is possible to export it in XML format compatible with MS-Project. Engeman Cloud does not include MS-Project installed.

- Exporting to other proprietary file formats (XLS, DOC, etc.) may require local (or on remote host) installation and licensing of the corresponding software to complete these actions. Installation, licensing, and maintenance of these software are the sole responsibility of the customer. Engeman Cloud does not include MS-Office installed.

- Engeman® Web (IntraWeb) is deprecated and only compatible with versions of Engeman® Desktop 8.6.2.0 or lower.

11. ENGEMAN® SOLUTION ARCHITECTURE

The architecture of all the modules that make up the Engeman® solution can be seen in the diagram below.
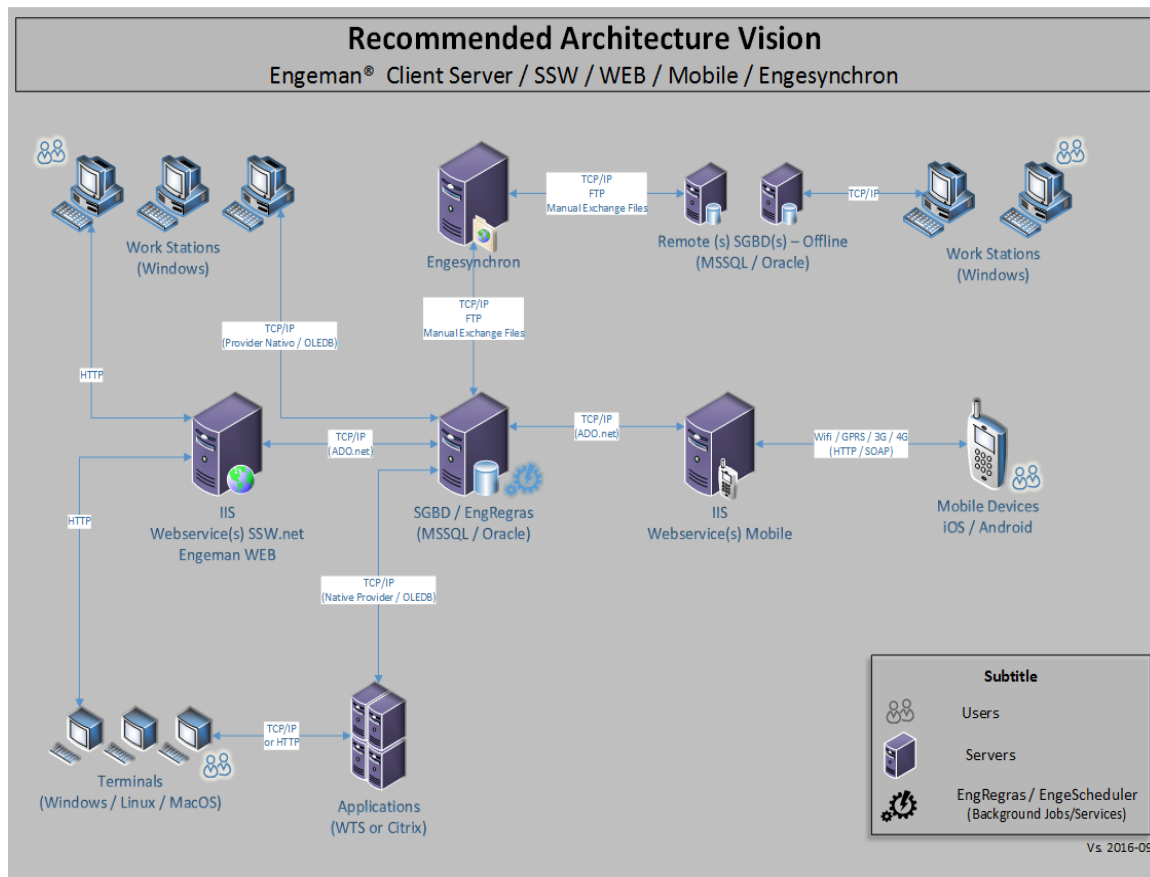
We emphasize that this is the recommended architecture when using all Engeman® solution modules. Service variations and junctions may exist if the hardware supports the recommended requirements for each module.

Some discontinued modules are still present at the illustration above only for consultation purpose: Engeman® Web (Intraweb) and Engesynchron.