Hardware and Software Requirements

Document Version 67
Updated July 31, 2025

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Milsoft Policy: *Supported* Microsoft® OS and SQL Versions

Milsoft has a policy that we will only support the use of our software with the versions of Microsoft® OS and SQL products currently listed under Microsoft's official schedule of "Mainstream Support." Please note that when Milsoft discontinues support in relation to a particular version of Microsoft® Product, this does not necessarily require your organization to update your Microsoft® products in order to continue to receive upgrades of Milsoft software; however, Milsoft will no longer develop or test for interoperability of our software with outdated Microsoft® products that are beyond their "Mainstream Support" window. The customer will assume all risk associated with a Milsoft upgrade or installation while using unsupported Microsoft® products. If problems arise from relying upon an unsupported product, Milsoft may ask you to upgrade to current Microsoft® products in their "Mainstream Support" or roll back to an earlier version of our software to be compatible. Your utility is therefore encouraged to proactively upgrade all your Microsoft® products and servers to the latest available version as practicable to maintain seamless interoperability with our software.

To verify the dates listed in this document; you can search the dates that Microsoft® has listed for Mainstream Support (on the Microsoft® Website at https://support.microsoft.com/en-us/lifecycle/search).

- OS: Milsoft has ended support for interoperability of our Core E&O software with **Windows Server® 2019 Standard** as of **January 9, 2024**, with the end of mainstream support from Microsoft®.
- SQL: Milsoft will end support for interoperability of our Core E&O software with **SQL Server® 2019** on **January 8, 2030**, with the scheduled end of extended support from Microsoft®.

Special Note about Compatibility with 2012 R2 OS/SQL:

Customers with an existing Milsoft Outage Management System that use the Public Web Outage Viewer™ (WOV) software **cannot** upgrade past version 8.7.34.5060 if they are still using Microsoft® SQL Server® 2012 R2 to host their DisSPatchSQL database, or if their WOV is installed on a Windows Server® 2012 R2 machine. There are known compatibility problems with SQL Server® 2012 R2 and Windows Server® 2012 R2. The new WOV requires a newer version SQL/OS to function correctly.

Customers with an existing Milsoft Outage Management System that uses any licensed product, including but not limited to DisSPatch Server, WindMil, WindMil Maps, Background Maps, or LightTable, cannot upgrade past version 8.7.64.10045 if they are still using Microsoft® Server 2012 or Microsoft® Server 2012 R2.

Microsoft® ended all support for SQL Server® 2012 R2 on July 12, 2022 and for Windows Server® 2012 R2 on October 10, 2023. With the end of that support, Microsoft® will no longer publish security updates. It is highly recommended to upgrade to the latest Windows Server® and SQL Server® versions to avoid vulnerabilities and prevent delays in Milsoft® software upgrades.

Trademark Acknowledgements

Product names and companies mentioned in this document, including Microsoft, Microsoft Windows, Microsoft SQL Server, Microsoft Windows Media Player, Microsoft Office, Azure, Microsoft Edge, Windows Hello, IBM, Power9, Intel, Intel Xeon, Intel Core i3, Intel Core i5, Intel Core i7, Partner Hub, VMware vSphere, Apple, Apple iPad Pro, iOS, Esri ArcMap, Dell R630, Google Chrome, Mozilla Firefox, Opera, Adobe, Adobe Acrobat Reader, Envision, Java, Apache Tomcat, MongoDB, and MonetDB, are all trademarks, ® or ™, belonging to their respective companies. Milsoft refers to these marks in the following pages and throughout this document in terms of nominative fair use and is in no way making any claim of ownership, endorsement, or affiliation.

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Requirements for Milsoft® Core Engineering and Operations (E&O) Systems

Core E&O System Configuration Guidelines

The number and configuration of your Milsoft® server or servers depend on which products you own and the size of your utility. We use the acronyms "EA" "GIS" and "OMS" to mean our **E**ngineering **A**nalysis software (WindMil® / LightTable®), our **G**eographic **I**nformation **S**ystem software (WindMilMap®), and **O**utage **M**anagement **S**ystem software (DisSPatch®, Calls Manager™, Crew Manager™, Reports™, Web Outage Viewer™), respectively. Use the following guidelines to help determine what servers you need, and which requirements you need to follow.

When determining the size of your utility, please consider any potential for significant growth over the expected lifetime of the server that could impact the number of elements in your electrical model. Small utilities are defined as having fewer than 100,000 elements in their engineering model (*.wm model), including map points —poles, pads, pedestals, etc. Medium utilities are defined as having from 100,000 to 650,000 elements in their engineering model. Large utilities are defined as having 650,001 or more elements in their engineering model. If you are unsure how many elements your engineering model has, we can help you determine that information.

Ultimately, we want to ensure that even when the system is heavily used, there are no bottlenecks for system resources that might prevent efficient use of the system as a whole. Our goal is for your utility to have a good experience with your purchased Milsoft software - and the first step is ensuring that you have adequate infrastructure to run the server-side software. Please use the table on the following page to determine how many servers your utility will need.

Milsoft recommends keeping Windows up to date. Windows updates can help keep your system secure, stable, and running efficiently. Even if you have anti-virus or anti-malware software, it's still important to install security updates as soon as they become available.

Core E&O System Configuration Guidelines (Continued)

Virtual Machines vs Physical Hardware

Physical Hardware Servers have been found to perform slightly better than Virtual Machines with the same resources. Plan to allocate 110% to 125% of the CPU resources and 105% - 110% of the disk resources required by a physical hardware solution to the virtual machines used for the solution. By configuring the virtual machine with additional resources, you will ensure that it can provide performance on par with physical hardware while accommodating any overhead required by virtualization technology. Additionally, we recommend that resources be **dedicated** with **high priority** and not dynamically assigned to the virtual machine. Dynamic resources may not be immediately available when the software needs them in a busy server environment, impacting performance.

Small Utilities - Use this chart if your model has less than 100,000 elements. Most small utilities can fit all Milsoft® applications on a single server.

Server → / ↓ Software	Server 1 (pg. 7/8) (SQL/Application Server)	Server 2 (pg. 9) (Application Server)	Server 3 (pg. 10) (Application Server)	Server 4 (pg. 11) (DMZ Server)
EA or GIS	SQL Single Instance /EA/GIS Server Required			
OMS	SQL Single Instance /OMS Server Required			WOV Server Recommended
EA + OMS	SQL Single Instance /EA/OMS Server Required		EA Server Optional	WOV Server Recommended
EA + GIS + OMS	SQL Single Instance /EA/GIS/OMS Server Required	OMS Server Recommended	EA/GIS Server Optional	WOV Server Recommended

Medium Utilities - Use this chart if your model has between 100,000 and 650,000 elements.

Server → / ↓ Software	Server 1 (pg. 7/8) (SQL/Application Server)	Server 2 (pg. 9) (Application Server)	Server 3 (pg. 10) (Application Server)	Server 4 (pg. 11) (DMZ Server)
EA or GIS	SQL Single Instance /EA/GIS Server Required		EA/GIS Server Recommended	
OMS	SQL Single Instance /OMS Server Required	OMS Server Recommended		WOV Server Recommended
EA + OMS	SQL Single Instance /EA Server Required	OMS Server Required	EA Server Optional	WOV Server Recommended
EA + GIS + OMS	SQL Single Instance /EA/GIS Server Required	OMS Server Required	EA/GIS Server Optional	WOV Server Recommended

Large Utilities - If you have 650,001 or more elements in your model, we consider you to be a large utility. Milsoft will work with you to individually tailor a server configuration for optimal speed. Use the following as an initial guideline.

Server → / ↓ Software	Server 1 (pg. 7/8) (Dedicated SQL Server)	Server 2 (pg. 9) (Application Server)	Server 3 (pg. 10) (Application Server)	Server 4 (pg. 11) (DMZ Server)
EA or GIS	SQL Single Instance Server Required		EA/GIS Server Required	
OMS	SQL Single Instance Server Required	OMS Server Required		WOV Server Recommended
EA + OMS	SQL Single Instance Server Required	OMS Server Required	EA Server Required	WOV Server Recommended
EA + GIS + OMS	SQL Single Instance Server Required	OMS Server Required	EA/GIS Server Required	WOV Server Recommended

Test Systems - If you have one or more test systems for Milsoft software, use the following as a guide.

Server → / ↓ Software	Server 1 (pg. 7/8) (SQL/Application Server)	Server 2 (pg. 9) (Application Server)	Server 3 (pg. 10) (Application Server)	Server 4 (pg. 11) (DMZ Server)
Option 1, use Prod SQL	n/a [*Use Production SQL for Test DB*]	Test Application Server		
Option 2, Single Server	All-in-one Test Server with SQL Single Instance			
Option 3, Like Prod	Use same number of servers as the Production Environment			

MILSOFT Utility Solutions

Single Server (Small Utilities)

For most small utilities, this single server will host all of the Milsoft® server applications. Recommendations are based on internal benchmarking and stress tests performed at customer locations.

	Minimum	Recommended
CPU	8-Core Intel® Xeon® processor, 2.0GHz or higher • Haswell architecture or newer.	12-Core Intel® Xeon® processor, 3.0GHz or higher
RAM	16GB RAM	32GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application/DB Logical Drive, 100GB SQL Logs Logical Drive, 40GB • Actual required space depends on the size of your model and databases. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application/DB Logical Drive, 200GB SQL Logs Logical Drive, 80GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2022 Standard	Windows Server® 2025 Standard
SQL Version	SQL Server® 2019 Standard - Core License • OMS customers must use Core Licensing. SQL Server Express® might be an option for some EA or GIS customers, but it has limitations on processor, memory, and database size. We do not test using the Express version; therefore, customers who opt to use SQL Express do so at their own risk/discretion. Please note that if the limitations of SQL Server Express are exceeded, you will need to change your installation to SQL Server Standard.	SQL Server® 2022 Standard - Core License
Other Requirements	.NET 4.7.2 (or above) .NET 3.5 Service Pack 1 If this server hosts the Public Web Outage Viewer: Version 24.1 or newer - .NET 8 (x64) Version 22.1-23.2 - .NET 6 (x64) Prior to Version 22.1 - .NET Core 3.1 Internet Information Services (IIS) Due to port conflicts, Milsoft® Field Engineering™ (FE) or Partner® Hub™ should not be installed on the same server as the Milsoft EA/GIS system. The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). The name must not be only numeric. We strongly recommend running the Rights Management System (RMS) on your OMS server. If this server is used for hosting the RMS, it will need to have port 5093 available to both Milsoft server components and client machines. It must also be able to communicate with the Milsoft licensing endpoint, at https://milsoft.prod.sentinelcloud.com/. SQL Database Replication requires SQL Server 2016+. The feature can be installed on the same SQL Server Instance as the default DisSPatchSQL database, as a new instance on the same server, or as a separate server altogether.	

Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur. • Fixed-size disks are recommended over **Dynamically Expanding Disks**, as this can cause resource allocation issues in a shared server environment where other VMs exist on a single Server.

SQL/Application Server (Server 1)

The SQL/Application Server hosts the Microsoft® SQL Server® instance for the DisSPatchSQL database (OMS) and/or ExternalTables database (EA/GIS). For most medium utilities, this will host the SQL Server instance, and a second server will host either the EA/GIS or OMS software.

	Minimum	Recommended
CPU	8-Core Intel® Xeon® processor, 2.6GHz or higher • Haswell architecture or newer.	12-Core Intel® Xeon® processor, 3.0GHz or higher
RAM	16GB RAM	32GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application/DB Logical Drive, 100GB SQL Logs Logical Drive, 40GB • Actual required space depends on the size of your model and databases. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application/DB Logical Drive, 200GB SQL Logs Logical Drive, 80GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2022 Standard	Windows Server® 2025 Standard
SQL Version	SQL Server® 2019 Standard - Core License • OMS customers must use Core Licensing. SQL Server Express® might be an option for some EA or GIS customers, but it has processor, memory, and database size limitations. We do not test using the Express version; therefore, customers who opt to use SQL Express do so at their own risk/discretion. Please note that if the limitations of SQL Server Express are exceeded, you will need to change your installation to SQL Server Standard.	SQL Server® 2022 Standard - Core License
Other Requirements	.NET Framework 4.7.2+ .NET Framework 3.5 Service Pack 1 .NET 8 Due to port conflicts, Milsoft® Field Engineering™ (FE) or Partner® Hub™ should not be installed on the same server as the Milsoft EA/GIS system. The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). The name must not be only numeric. We strongly recommend running the Rights Management System (RMS) on your OMS server. If this server is used for hosting the RMS, it must have port 5093 available to both Milsoft server components and client machines. It must also be able to communicate with the Milsoft licensing endpoint at https://milsoft.prod.sentinelcloud.com/. SQL Database Replication requires SQL Server 2016+. The feature can be installed on the same SQL Server Instance as the default DisSPatchSQL database, as a new instance on the same server, or as a separate server altogether. Milsoft's software installers require the ability to execute remote signed PowerShell scripts. Group Policy settings for PowerShell require RemoteSigned execution policy for the user executing installation.	

Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved** and set to **High Priority**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur. • Fixed-size disks are recommended over **Dynamically Expanding Disks**, as this can cause resource allocation issues in a shared server environment where other VMs exist on a single Server.

OMS Application Server (Server 2)

If your utility needs to dedicate a machine for the OMS Application Server, please follow the specifications below.

	Minimum	Recommended
CPU	4-Core Intel® Xeon® processor, 2.6GHz or higher • Haswell architecture or newer.	8-Core Intel® Xeon® processor, 3.0GHz or higher
RAM	16GB RAM	32GB RAM
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • Actual required space depends on the size of your model and databases. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2022 Standard	Windows Server® 2025 Standard
Other Requirements	.NET 4.7.2 (or above) .NET 3.5 Service Pack 1 If this server hosts the Public Web Outage Viewer: Version 24.1 or newer - .NET 8 (x64) Version 22.1-23.2 - .NET 6 (x64) Prior to Version 22.1 - .NET Core 3.1 Internet Information Services (IIS) Milsoft Service Manager requires Firefox or any Chromium-based browser such as Chrome or Edge. The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). The name must not be only numeric. We strongly recommend running the Rights Management System (RMS) on your OMS server. If the OMS server is used it will need to have port 5093 available for both Milsoft server components and client machines. It must also be able to communicate with the Milsoft licensing endpoint at https://milsoft.prod.sentinelcloud.com/. Milsoft's software installers require the ability to execute remote signed PowerShell scripts. Group Policy settings for PowerShell require RemoteSigned execution policy for the user executing installation.	
Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved a**nd set to **High Priority**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur. • Fixed-size disks are recommended over **Dynamically Expanding Disks**, as this can cause resource allocation issues in a shared server environment where other VMs exist on a single Server.	

EA/GIS Application Server (Server 3)

If your utility needs to dedicate a machine as an EA Application Server or EA/GIS Application Server, please follow the specifications below.

	Minimum	Recommended
CPU	4-Core Intel® Xeon® processor, 2.6GHz or higher • Haswell architecture or newer.	4-Core Intel® Xeon® processor, 3.0GHz or higher
RAM	16GB RAM	32GB RAM
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • Actual required space depends on the size of your model and databases. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2022 Standard	Windows Server® 2025 Standard
Other Requirements	.NET Framework 4.7.2+ .NET Framework 3.5 Service Pack 1 .NET 8 Due to port conflicts, Milsoft® Field Engineering™ (FE) or Partner® Hub™ should not be installed on the same server as the Milsoft EA/GIS system. The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). The name must not be only numeric. We strongly recommend running the Rights Management System (RMS) on your OMS server. For utilities that do not have OMS, this server can be used to host the RMS. EA/GIS servers used for this purpose will need to have port 5093 available to Milsoft server components and client machines. It must also be able to communicate with the Milsoft licensing endpoint at https://milsoft.prod.sentinelcloud.com/. Milsoft's software installers require the ability to execute remote signed PowerShell scripts. Group Policy settings for PowerShell require RemoteSigned execution policy for the user executing installation.	
Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved** and set to **High Priority**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur. • Fixed-size disks are recommended over **Dynamically Expanding Disks**, as this can cause resource allocation issues in a shared server environment where other VMs exist on a single Server.	

DMZ Server (Server 4) - Web Outage Viewer™ (WOV)

The server hosting the Public Web Outage Viewer™ (WOV) application is typically separated from the main network and placed on a DMZ zone, thereby limiting exposure to requests from those seeking outage information from the Web Outage Viewer application. These requirements can also be used to create a server for any component that a utility wishes to run apart from an internal server, such as a single integration server. If additional software (such as other web hosting software) is installed on the machine, we recommend increasing the resources for the server.

	Minimum	Recommended
CPU	4-Core Intel® Xeon® processor, 2.6GHz or higher • Haswell architecture or newer.	4-Core Intel® Xeon® processor, 3.0GHz or higher
RAM	8GB RAM	16GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • Actual required space depends on the size of your model and databases, and if the DMZ server hosts any other applications. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	Separate network cards for external traffic, and for traffic back to your internal network
Operating System	Windows Server® 2022 Standard	Windows Server® 2025 Standard
Other Requirements	.NET 4.7.2 (or above) .NET 3.5 Service Pack 1 If this server hosts the Public Web Outage Viewer: Version 24.1 or newer - .NET 8 (x64) Version 22.1-23.2 - .NET 6 (x64) Prior to Version 22.1 - .NET Core 3.1 Internet Information Services (IIS) The server name can only be alphanumeric characters (A-Z,a-z,0-9). The only other character allowed is a hyphen (-). The name must not be only numeric. We strongly recommend running the RMS on your OMS server (or EA/GIS server for customers who do not have OMS). However, this server can be used to host the Rights Management System (RMS). If it is used for this purpose, it will need to have port 5093 available to Milsoft server components and client machines. It must also be able to communicate with the Milsoft licensing endpoint at https://milsoft.prod.sentinelcloud.com/. Milsoft's software installers require the ability to execute remote signed PowerShell scripts. Group Policy settings for PowerShell require RemoteSigned execution policy for the user executing installation.	
Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved** and set to **High Priority**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur. • Fixed-size disks are recommended over **Dynamically Expanding Disks**, as this can cause resource allocation issues in a shared server environment where other VMs exist on a single Server.	

Licensing Server

For Enterprise customers, the Milsoft® Rights Management System (RMS) can run on any of your other Milsoft servers. We strongly recommend running the RMS on your OMS server (or EA/GIS server for customers who do not have OMS). However, if your utility needs to host the RMS on a separate server, you can use the following guide to ensure it has the minimum specifications.

For Stand-Alone WindMil® and LightTable® customers, the RMS should be deployed in a location that all of the client machines can access. Please use the minimum specifications below to find an adequate client or server machine on which to deploy the RMS.

	Minimum
CPU	1.0 GHz processor, or 1 vCPU
RAM	1GB RAM
Drive Space	Minimum available space: 150MB. We recommend approximately 1GB available space for the collection of log and usage data.
Network Connection	The RMS on Port 5093 must be able to communicate bidirectionally with Milsoft server components and any EA (WindMil® and LightTable®) and GIS (WindMilMap®) client machines. DisSPatch® clients must also be able to reach it, if they are using Streaming LandBase capabilities. The Sentinel Cloud Plugin (SCP) requires bidirectional communication with the Milsoft Licensing endpoint at https://milsoft.prod.sentinelcloud.com/ across port 443.
Operating System	A wide variety of Windows® Operating Systems will work for running the RMS. However, we recommend the following: • Windows® 10 22H2 or above • Windows Server® 2025
Other Requirements	The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). The name must not be only numeric. Support for TLS 1.2. We do not allow TLS 1.0.

Client Machine(s)

The following specifications should be used for a client machine running WindMilMap®:

	Minimum	Recommended
CPU	Intel® Core™ i7 processor, 4-Core, 2.2GHz or higher	Intel® Core™ i9 processor, 4-Core, 3.0GHz or higher
RAM	16GB RAM	32GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • Actual required space depends on the size of your model and databases, and how many other applications are installed on the client machine.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	100 Mbps network connection	1 Gbps or higher network connection
Displays	Single Monitor / Dual Monitor, 1024x768 or greater screen resolution when running DisSPatch®"	
Operating System	Windows® 10 (64-bit)	Windows® 11 (64-bit)
Licensing Requirements	For client licensing, you will need to access the installed Milsoft Rights Management System (RMS) software on Port 5093. We strongly recommend running the RMS on your OMS server (or EA/GIS server for customers who do not have OMS). However, if required, a WindMilMap client machine could run the RMS application. If a client does run the RMS, it will need to be accessible by all client applications on Port 5093. Additionally, the RMS requires the ability to connect to the Milsoft Licensing endpoint at https://milsoft.prod.sentinelcloud.com/.	
Other Requirements	.NET 4.7.2 (or above) .NET 3.5 Service Pack 1 Esri® ArcMap® is required for WindMilMap to operate. The client machine must also meet minimum specifications as defined by Esri. Milsoft client machines can only connect to a single Milsoft Core E&O instance. Switching a client between Production and non-Production environments requires uninstalling the software from the client and installing it using the installer files of the other system. There is no visual distinction between environments when logged in to the software, so ensure that machines that connect to Production and non-Production environments are clearly identified to your users.	
ESRI Version	Esri ArcMap 10.8.2 on 21.0.18.11956 or newer Esri ArcMap 10.8.1 on 8.7.53.8200 through 21.0.17.11875 Esri ArcMap 10.7.1 on 8.7.33.4890 through 8.7.48.48.7591 Esri ArcMap 10.6.1 on 8.7.23.2358 through 8.7.31.3930 Esri ArcMap 10.5.1 on 8.7.7.10591 through 8.7.20.2086 Esri ArcMap 10.4.1 on 8.6.6.9756 through 8.7.5.10366 Esri ArcMap 10.3.1 on 8.2.0.7807 through 8.6.5.9539 Esri ArcMap 10.2.2 on 8.2.0.5122 through 8.2.0.7373 Esri ArcMap 10.2 on 8.2.0.4968 or older Small Utility Enterprise License Agreement http://www.esri.com/industries/ela/suela	

Benchmarking

In-house benchmarking was performed in a controlled environment to set minimum and recommended hardware standards for running Milsoft Software efficiently. Running additional software/ processes on the same server or VM as the Milsoft Applications can reduce the efficiency of the Milsoft Applications during a major event, causing delays in predicting outages, processing calls, and even working outages from client machines. It is recommended that no additional software be installed on a server intended for Milsoft Applications; this includes using the SQL instance for other (non-Milsoft related) databases/queries, as Milsoft's products rely on SQL to function.

Through these benchmarking tests, it has been observed that the CPU plays a significant role in the processing operations of Milsoft's Core E&O product. As a result, the recommendations for CPU on the **SQL/Application Server (Server 1)** and **Single Server (Small Utilities)** are higher to accommodate efficient and timely processing of SQL queries while leaving enough resources for the Core E&O software to function.

Benchmarking Results:

DisSPatch Predictor— The predictor was tested in a Virtual Machine (VM) configured as a Single Server using a Standard Data Set. The times below show how long the DisSPatch Predictor processes 6,000 new calls and predicts the resulting outages.

(4 Core CPU 32 GB RAM)	(6 Core CPU 32 GB RAM)	(8 Core CPU 32 GB RAM)	(12 Core CPU 32 GB RAM)
1m 6.39s (66.39s) [90.37 Calls Per Second]	51.45s [116.62 Calls Per Second]	37.19s [161.33 Calls Per Second]	35.82s [167.50 Calls Per Second]

DisSPatch– DisSPatch was tested in a Virtual Machine (VM) configured as a Single Server using a Standard Data Set. The times below show how long DisSPatch rendered and displayed outages from 6,000 new calls.

(4 Core CPU 32 GB RAM)	(6 Core CPU 32 GB RAM)	(8 Core CPU 32 GB RAM)	(12 Core CPU 32 GB RAM)
1m 25.18s (85.18s)	1m 24.77s (84.77s)	1m 10.08s (70.08s)	1m 9.29s (69.29s)

Operations Data Service— The ODS was tested in a Virtual Machine (VM) configured as a Single Server using a Standard Data Set. The times below show how long it took to process 3,000 new calls and 3,000 callbacks through subscribed outbound notifications.

(4 Core CPU 32 GB RAM)	(6 Core CPU 32 GB RAM)	(8 Core CPU 32 GB RAM)	(12 Core CPU 32 GB RAM)
1m 33.43s (93.43s)	1m 20.29s (80.29s)	1m 20.46s (80.46s)	1m 12.43s (72.43s)

Stress Test Results:

The following results were recorded at three customer sites as they worked with Milsoft to configure their server environments. A stress test was run on the Milsoft application, and readings were taken from SQL at specific intervals. These were the best-recorded results from each customer.

	CPU Core(s) on SQL Server	Events Per Second Processed
Customer 1 (Single Server)	12	7.5400
Customer 2 (Multi-Server)	16	8.029
Customer 3 (Multi-Server)	32	15.91666

Requirements for Milsoft® Communications Platform

Communications Platform Configuration Guidelines

The number and configuration of your Milsoft Communications™ server or servers depend on how many phone lines your Milsoft IVR™ is configured to use, whether or not your Milsoft IVR system accepts payments, and whether or not your Communications Server accepts inbound texts using Milsoft's texting solution.

Please note that Milsoft normally supplies a Dell® R640™ for a physical on-site IVR server if your IVR configuration requires physical telephony, but we are also able to deploy our software to a virtual machine (VM) provided by your utility if it meets our minimum system requirements.

- If other non-Milsoft applications are running on the server, the server must have additional resources with which to operate. Milsoft applications and services must have reserved resources that meet the minimum Hardware Specifications.
- For Milsoft IVR systems processing credit card payments, the server on which the Milsoft IVR Engine™ resides is in scope for Payment Card Industry Data Security Standard (PCI-DSS) regulations and must reside in a PCI compliant network. Also, they may not share infrastructure with Milsoft Core E&O or any other systems. See Milsoft's PCI SSS Documentation for more information.
- For Milsoft IVR systems processing credit card payments and accepting inbound texts, the BLS™ that will receive inbound texts must be installed on a server separate from the IVR Engine™ that transmits payment data. A separate Server/VM for a BLS (text receiver) is required for PCI (credit card processing) compliance. If your utility processes eChecks only and accepts no credit card payments, this requirement for a separate server to handle texting would not apply.

Communications Platform Common Configurations

IVR – 24 lines or less

Use this chart if your utility has a Milsoft IVR solution, 24 lines or less.

Server → / ↓ Functionality	**Server 1 (pg. 19)** (SQL/Application Server)	**Server 2 (pg. 20)** (IVR/BLS Server)	**Server 3 (pg. 21)** (BLS Server)
IVR	SQL/BLS/IVR Server Required		
IVR + CC Payments	SQL/BLS/IVR Server Required		
IVR + Two-way Texting	SQL/BLS/IVR Server Required		BLS Server Recommended
IVR + CC Payments + Two-way Texting	SQL/BLS/IVR Server Required		BLS Server Required

NOTE: The Milsoft communications software does not support in-place OS or SQL upgrades. Please contact Milsoft support if a server upgrade or migration is required.

Communications Platform Common Configurations (Continued)

IVR – 25 lines or greater

Use this chart if your utility has a Milsoft IVR™ solution, 25 lines or greater.

Server → / ↓ Functionality	Server 1 (pg. 19) (Dedicated SQL Server)	Server 2 (pg. 20) (IVR/BLS Server)	Server 3 (pg. 21) (BLS Server)
IVR	SQL Server Required	IVR/BLS Server Required	
IVR + CC Payments	SQL Server Required	IVR/BLS Server Required	
IVR + Two-way Texting	SQL Server Required	IVR/BLS Server Required	BLS Server Recommended
IVR + CC Payments + Two-way Texting	SQL Server Required	IVR/BLS Server Required	BLS Server Required

Communications Platform – No Phone Calls

Use this chart if your utility does not use IVR for phone calls, but does have another communications software, such as Milsoft Personnel Notifications™ (MPN), Milsoft Customer Outage Alerts™ (MCOA), or Two-way Texting™. In this case, the SQL Server does not have to be dedicated, but a SQL instance is needed for the database.

Server → / ↓ Functionality	Server 1 (pg. 19) (SQL Server)	Server 2 (pg. 20) (IVR/BLS Server)	Server 3 (pg. 21) (BLS Server)
MPN Only	SQL Server Required		BLS Server Required
MPN + MCOA	SQL Server Required		BLS Server Required
MPN + MCOA + Two-way Texting	SQL Server Required		BLS Server Required
MCOA Only	SQL Server Required		BLS Server Required
MCOA + Two-way Texting	SQL Server Required		BLS Server Required

NOTE: The Milsoft communications software does not support in-place OS or SQL upgrades. Please contact Milsoft support if a server upgrade or migration is required.

SQL/Application Server (Server 1)

These requirements can apply to a physical or virtual server. If your utility has a Milsoft® Core E&O system, or, if other non-Milsoft IVR databases are utilizing the same database server, be aware that issues with or maintenance to SQL Server may cause the IVR to be inoperable and unable to process phone calls.

		Recommended
CPU	For a Physical Server: 4-Core Intel® Xeon® Silver processor, 2.6GHz or higher • Haswell architecture or newer. For a VM: 24 Lines or Less requires 2 vCPU 25 Lines or Greater requires 4 vCPU	For a Physical Server: 4-Core Intel® Xeon® processor, 3.0GHz or higher For a VM: 4 vCPU is recommended
RAM	8GB RAM	16GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application/DB Logical Drive, 100GB SQL Logs Logical Drive, 40GB • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application/DB Logical Drive, 200GB SQL Logs Logical Drive, 80GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2016 Standard • Server 2016 is only supported for IVR V46 and higher.	Windows Server® 2022 Standard • Server 2022 is only supported for IVR V22.51 and higher.
SQL Version	SQL Server® 2016 Service Pack	SQL Server® 2022 Standard - Core License • SQL Server 2022 is only supported for IVR V22.51 and higher.
Other Requirements	The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-). Version 22.51 .NET 4.7.2 Version 23.52 .NET 4.8	
Notes for Virtual Machienes	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur.	

NOTE: The Milsoft communications software does not support in-place OS or SQL upgrades. Please contact Milsoft support if a server upgrade or migration is required.

IVR / BLS™ Server (Server 2)

At 25 lines or greater, the Milsoft IVR™ system needs to be split between two servers. This second server will be used for the IVR and the BLS™. If the IVR system is going to take credit card payments and will also be used for Two-way Texting, a third server will be needed (see page 19).

	Minimum	Recommended
CPU	For a Physical Server: 4-Core Intel® Xeon® Silver processor, 2.6GHz or higher • Haswell architecture or newer. For a VM: 2 vCPU	For a Physical Server: 4-Core Intel® Xeon® processor, 3.0GHz or higher For a VM: 4 vCPU is recommended
RAM	8GB RAM	16GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2016 Standard	Windows Server® 2022 Standard • Server 2022 is only supported for IVR V22.51 and higher.
Other Requirements	The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-).	
	Version 22.51 .NET 4.7.2 Version 23.52 .NET 4.8	
Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur.	

NOTE: The Milsoft communications software does not support in-place OS or SQL upgrades. Please contact Milsoft support if a server upgrade or migration is required.

BLS™ Server (Server 3)

For systems enabling both payments and two-way texting features, the BLS™ that will receive inbound texts must be installed on a server separate from the IVR Engine™ that transmits credit card payment data. A separate Client/VM for a BLS (text receiver) is required for PCI compliance.

	Minimum	Recommended
CPU	For a Physical Server: 4-Core Intel® Xeon® processor, 2.0GHz or higher • Haswell architecture or newer. For a VM: 2 vCPU	For a Physical Server: 4-Core Intel® Xeon® processor, 3.0GHz or higher For a VM: 4 vCPU
RAM	8GB RAM	16GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB • Actual required space depends on if the server hosts any other applications. • We recommend a RAID1 or better for physical servers.	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	1 Gbps network connection	
Operating System	Windows Server® 2016 Standard	Windows Server® 2022 Standard • Server 2022 is only supported for IVR V22.51 and higher.
Other Requirements	The server name must be alphanumeric characters (A-Z,a-z,0-9) only. The only other character allowed is a hyphen (-).	
	Version 22.51 .NET 4.7.2 Version 23.52 .NET 4.8	
Notes for Virtual Machines	For Virtual Machines, we currently test using VMware® vSphere™ 7+. • Resources such as CPU and RAM must be **reserved**, not just **allocated**. Customers who have only allocated resources on the host machine have seen significant problems occur.	

NOTE: The Milsoft communications software does not support in-place OS or SQL upgrades. Please contact Milsoft support if a server upgrade or migration is required.

Client Machine (Communications)

Client Applications: Milsoft® OCM™, Crew Call™

Web Application: BLS™

	Minimum	Recommended
CPU	Intel® Core™ i3 processor	
RAM	8GB RAM	16GB RAM or higher
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 100GB	OS Logical Drive, 160GB Application Logical Drive, 200GB • We recommend SSD for optimal performance.
Network Connection	100 Mbps network connection	1 Gbps network connection
Display	Single Monitor, 1152x864 or greater screen resolution	
Sound	Sound Card / Speakers / Microphone	
Operating System	Windows® 10 (64-bit)	
Internet Browser	Google® Chrome™, Mozilla Firefox®, or Microsoft Edge®	
Other Requirements	Windows Media Player®.	

Requirements for CIS/FMS/WMS Products

Requirements for Hosted iXp™ Solution

The Milsoft Hosted iXp Solution, which contains any or all of the following systems: the Customer Information System (CIS), Financial Management System (FMS), and Work Management System (WMS), requires merely a high-speed internet connection, on-site LAN, and a secure VPN connection. The minimal requirements are as follows.

	Requirements
High-speed internet access	Dedicated high-speed (5 Mbps) or faster connection. DSL and cable are not recommended nor supported as a Utility's primary internet service, but can be used as an emergency backup option.
Local Area Network	Switched Ethernet. Hubs are not supported.
Network firewall	Capable of supporting a constant LAN-to-LAN IPsec VPN connection.

Users can operate Milsoft iXp using any popularly-available internet browser, which does not require any Milsoft software to be loaded on client machines. Please note, however, a modern internet browser is needed to access the Milsoft solution. The most common and quality assurance tested browser is Google® Chrome™. Additionally, Microsoft Office® and a .pdf reader are needed to view reports. See further details on Page 22.

Requirements for On-Premise iXp™® Solution

For on-premise installations of Milsoft iXp®, both an IBM® Power10™ Server and an iXp Application Server are required. The Application Server needs to be a stand-alone Windows® server connected to the network. For the Application Server, the 'Minimum' requirements will be sufficient if you have fewer than 40 users, but use the 'Recommended' requirements if you have 40 or more users.

IBM Power Server Specifications

The specifications below are for the minimum requirements for an IBM® Power10™ Server. However, Milsoft will work with your team to establish the exact IBM Power Server requirements for your implementation.

	Minimum
CPU	26,575CPW
RAM	64GB RAM
Network Connection	1 Gbps network connection
Operating System	OS/400 Operating System v7.3 or higher

Application Server Specifications

Use the Minimum requirements if you have fewer than 40 users. Use the Recommended requirements if you have 40 users or more.

	Minimum (fewer than 40 users)	Recommended (40+ users)
CPU	4-Core Intel® Xeon® processor, 2.5GHz	8-Core Intel® Xeon® processor, 2.5GHz or higher
RAM	16GB RAM	32GB RAM
Logical Drives	OS Logical Drive, 80GB Application Logical Drive, 40GB of free space on non-OS partition • Application Logical Drive cannot contain the OS. • RAID 5 Disk striping or built as a virtual machine for quick recovery.	OS Logical Drive, 160GB Application Logical Drive, 40GB of free space on non-OS partition • Application Logical Drive cannot contain the OS. • RAID 5 Disk striping or built as a virtual machine for quick recovery.
Network Connection	1Gbps or higher network connection	
Operating System	Windows Server® 2022 Standard, (64-bit)	Windows Server® 2022 Standard, (64-bit)
Other Requirements	• Anti-virus protection. • Administrative login via Remote Desktop for Milsoft IT to configure software components. • 3yr 24x7x4 hardware support contract in the event of hardware failure.	

CIS/FMS/WMS Client Machine Specifications

Users are able to operate Milsoft iXp® using any internet browser, which does not require any Milsoft software to be loaded on client machines. However, a modern internet browser is needed to access the Milsoft solution. The most common and quality assurance tested browser is Google® Chrome™. Additionally, Microsoft Office® and a .pdf reader are needed to view reports.

	Minimum	Recommended
Web Browser	Latest version of Google® Chrome™	
Network Connection	100 Mbps network connection	1 Gbps or higher network connection
Display		Capable of 1920 x 1200 resolution
Other Requirements	Microsoft Office® 2019 Adobe® Acrobat Reader®	Microsoft Office® 2019 or latest version, or Microsoft 365 Adobe® Acrobat Reader®, latest version

Requirements for Milsoft® Ancillary Products

Milsoft FieldSyte™

- Powered by Reavis Code MapEngine™

The following are specifications for devices, as well as other requirements for the system.

	Required Specifications / Components
	Desktop (Windows®, Mac, Linux)
Browser	Google® Chrome™, Microsoft Edge®, latest version
	iOS® and iPadOS®
Browser	Safari®, latest version (>14)
iOS Version	iOS 14.7.1
RAM	3GB RAM
	Android®
Browser	Google® Chrome™, latest version
RAM	3GB RAM
Device	The minimum usable Android tablet is the S5e. Newer devices are recommended.
	Other Requirements
Server Component	• Reavis Code MapEngine™ (known as the "PremisesServer") must be installed on the Milsoft EA Server • A "Companion PremisesServer" is required for FieldSyte Electric Projects (Staking). Server requirements are 8GB of RAM, Server 2022 or 2025, and 120+ GB of hard drive space. It can run on a server with other applications but should not currently be on a server that hosts critical processes.
Network Connection	Must be able to reach your utility's app endpoint at https://app.fieldsyte.com/* and/or http://projects.fieldsyte.com/*
Milsoft Version	If your FieldSyte will be integrated with Milsoft's DisSPatch® system, the minimum Core E&O Version is 8.7.57. Version 22.0.8 is recommended.

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