

MLSuite[®] 2023 SP2 Installation Guide

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Revison History

Date	Rev.	Comments
10/12/2023	А	Initial Release
12/21/2023	В	Firewall Configuration section amended for accuracy/clarity, Azure Active Directory section added
1/31/2024	С	Advanced MLServer .ini Settings appendix added

How To Use This Guide

When you see a keyboard key's name in bold angle brackets (<>), this indicates a particular keystroke you must make in order to perform certain functions.

When you see two bolded locations separated by a vertical bar character (**Location 1** | **Location 2**), this indicates that the second location can be accessed only after the first. For example, an Import option that is available in a File drop-down menu in a toolbar would be denoted with **File** | **Import**.

References to other Canary Systems user's guides, third-party documentation or other external sources will appear bolder and italicized. For example: For more information, see the *MultiLogger User's Guide*.



Notes & Hints

Notes and Hints appear in boxes like this. **Notes** contain information you need to know to ensure that you use certain features correctly, minimizing any errors. **Hints** indicate tips on how to use certain features more effectively, such as any shortcuts to certain functions.



Related Documentation

Visit the User's Guide page on the Canary Systems website to view and download the most current versions of our technical documentation and user's guides at <u>canarysystems.com/support/users-guides</u>.

The following documents contain information that may be useful throughout the course of this manual:

- MLWebHardware User's Guide for additional information on data collection and import.
- MLWeb User's Guide for additional information on data visualization and presentation.
- MLReport User's Guide for additional information on using MLReport.
- The Canary Systems End-Users License Agreement can be found on the Canary Systems website under Software Downloads at <u>canarysystems.com/support/software-downloads</u>.

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Note
To contact Canary Systems for assistance or regarding the purchase of a support contract, you can reach the Support Team at:
+1.603.525.9800 Ext. 2
Support@canarysystems.com

Our website also provides numerous Application Notes, the latest versions of our software components, and all the latest User's Guides. Click the **Support** menu at **canarysystems.com** to access these resources.



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1. Getting Started

Note

As the 3rd generation of the platform, the introduction of MLWeb 2023 to Canary Systems MLSuite has necessitated significant upgrades and changes to the installation processes and functionality of several applications. **Legacy MLWeb users (2021 and previous) should take special care to review section** *1.2 Considerations for Legacy MLWeb Users* before moving forward with installation.

Canary Systems[®] MLSuite is a collection of powerful desktop, server, web, and mobile applications for Data Acquisition. MLSuite, also referred to MLSuite in this guide, consists of a group of applications, two database servers (Firebird SQL and PostgreSQL), and a web client that operates under the Microsoft .NET Core framework. These various software components may be installed and run on a single server or distributed throughout a LAN/WAN connected group of servers, depending on deployment size (see section *1.1 System Requirements*).

MLSuite is made up of the following applications:

MLServer – The main Windows Service that provides all business logic methods to MLWeb and MLField.

MLGateway – Windows Service that manages connected dataloggers, including automating programming and data collection.

MultiLogger – Windows client application for MLGateway. It provides for configuring the programming and data collection automation of MLGateway.

MLWebHardware – Web based application, used for the configuration and programming of data collection automation of MLGateway. This will eventually replace MultiLogger.

MLWeb – Data management application that provides a browser-based interface to the system. With introduction of this version, data imports are now initiated through this interface.

MLField – Mobile application that bridges the gap between data collection in the field and the project database.

MLReport – A robust report creation tool that can embed data and charts.

In addition, MLSuite includes several support applications and files:

MLAdmin - The MLWeb administration page.

MLEditor - A specialized editor for MultiLogger programming files.

Firebird - The Firebird SQL database.

PostgreSQL – The PostgreSQL database with PostGIS extension.

MLPerfindex – A tool for optimizing server performance (optional).

IBOConsole - A Firebird database management console (optional).

Icons – Installs a library of icons for data visualization (optional).

PGAdmin – A PostgreSQL database management console (optional).



This Installation Guide provides information on running the MLSuite installer, PostgreSQL and Add-ons, .Net Core, configuring MLAdmin, and uninstalling MLSuite.

1.1 System Requirements

MLSuite is a scalable suite of applications that can be used for one-user one-datalogger deployments all the way to enterprise-wide projects managing tens of thousands of sensors and many users. System Requirements scale along with the project size and scope, with the number of users, frequency and volume of data imports and reports, deployment of 3D and GIS components, and other factors.

The basic system requirements to run the software are listed below. From there, server specifications can vary widely. This section outlines four recommended deployments of increasing scale to be used as guidelines for optimal expected performance of the system.

Note

Due to the high input and output (I/O) requirements of the Firebird and Postgres databases, **the use of virtual machines or NAS storage is not recommended** as virtual servers may lose between 20% and 80% of their speed under a high load.

It is also strongly recommended that solid-state drives (SSD) are used as these allow for significantly more IOPS (up to 500,000 on PCIe-based hardware).

An SSD built on a dedicated database server, which is not virtualized, is the optimal solution for maximum performance for anything more than the most basic deployments.

1.1.1 Basic Requirements

Supported Operating Systems

• MLSuite is designed to run on Windows Server 2016, Windows Server 2019, Windows Server 2022, Windows 10, and Windows 11 operating systems.

Other Minimum Requirements - Server

- MLWeb is designed to run on the ASP .NET Core 7.0 Windows Hosting Bundle.
- 1 GB LAN required
- NAS/CIFS storage is not supported due to high latency of I/O operations
- 3.5 GHz CPUs minimum

Other Minimum Requirements - Clients

- Chromium based browser, such as Chrome or Edge
- Graphics Processor: GPU 1+ GB



1.1.2 Recommended Server Specifications

Minimal Environment

Intended primarily for testing, trial, or backup purposes, or for very small environments with only 1-2 users, limited data imports, and limited 3D data processing.

- Operating System: Windows 10 or Windows 11
- Processor: 3.5 GHz per core, 4 physical cores
- Memory: 32 GB
- Hard Drive: 1 TB SSD



Small Environment

Single server deployment running all MLSuite components for small projects with 1-4 concurrent users and limited 3D data processing requirements.

- Operating System: Windows Server 2016, Windows Server 2019, or Windows Server 2022
- Processor: 3.5 GHz per core, 8 physical cores
- Memory: 32 GB
- Hard Drive 1: 500 GB SSD for Operating System, Program Files, backups, and archives
- Hard Drive 2: 250 GB SSD dedicated to Firebird and PostgreSQL databases
- Hard Drive 3: 250 GB SSD for Page file and Temp folder







Medium Environment

Note Contact Canary Systems Support for assistance with tiered server setups.

Two server deployment, one dedicated to MLWeb, the second for remaining components. This setup will satisfy the most common project requirements for average size projects including medium sized, multi-user environments, and use of 3D data with infrequent processing.

- Operating Systems (each server): Windows Server 2016, Windows Server 2019, or Windows Server 2022
- Server 1 (running MLGateway, MLWeb, and MultiLogger)
 - Processors : 3 GHz per core, 4 physical cores
 - Memory: 32GB
 - Hard Drive 1: 250 GB SSD with 2 partitions
 - Partition 1 100 GB: Operating System
 - Partition 2 150 GB: Program Files
 - Hard Drive 2: 250 GB SSD for Page file and Temp folder
- Server 2 (running Firebird, Postgres, MLServer, and MLReport)
 - Processors : 3.5 GHz per core, 8 physical cores
 - o Memory: 32GB
 - Hard Drive 1: 500 GB SSD with 2 partitions
 - Partition 1 100 GB: Operating System
 - Partition 2 400 GB: Program Files, backups, archives
 - Hard Drive 2: 250 GB SSD dedicated to Firebird and PostgreSQL databases
 - Hard Drive 3: 250 GB SSD for Page file and Temp folder





Large Environment

Three server deployment for enterprise sized projects including multi-user access and frequent 3D data processing (such as regular radar data imports).

- Operating Systems (each server): Windows Server 2016, Windows Server 2019, or Windows Server 2022
- Processors (each server): 3.5 GHz per core, 8 physical cores
- Memory (each server): 32 GB
- Server 1 (running MLGateway, MLWeb, and MultiLogger)
 - Hard Drive 1: 250 GB SSD with 2 partitions
 - Partition 1 100 GB: Operating System
 - Partition 2 150 GB: Program Files
 - Hard Drive 2: 250 GB SSD for Page file and Temp folder
- Server 2 (running PostgreSQL)
 - Hard Drive 1: 500 GB SSD with 2 partitions
 - Partition 1 100 GB: Operating System
 - Partition 2 400 GB: Program Files, backups, archives
 - Hard Drive 2: 250 GB SSD dedicated to PostgreSQL databases
 - Hard Drive 3: 250 GB SSD for Page file and Temp folder
- Server 3 (running Firebird, Postgres, MLServer, and MLReport)
 - Hard Drive 1: 500 GB SSD with 2 partitions
 - Partition 1 100 GB: Operating System
 - Partition 2 400 GB: Program Files, backups, archives
 - Hard Drive 2: 250 GB SSD dedicated to Firebird databases
 - Hard Drive 3: 250 GB SSD for Page file and Temp folder



Note

Those installing MLSuite on a system for the first time may skip ahead to section *1.3 Pre-Installation Requirements*.



1.2 Considerations for Legacy MLWeb Users

MLWeb 2023 has been enhanced in numerous critical ways which make it incompatible with previous Canary Systems browser-based applications and associated components. Users maintaining databases in legacy MLWeb should carefully review the below considerations and/or **Appendix C – Example Migration from MLWeb 2021 to MLWeb 2023** of this guide to ensure the most efficient installation of MLSuite with MLWeb 2023.

- 1. It is recommended users backup existing database files. See **Appendix C**, section *C.1 Backing Up Existing Database Files*.
- 2. Previous versions of MLSuite and all associated components must be uninstalled. See **Appendix C**, section *C.2 Uninstall MLSuite and Components*.
- **3.** As MLWeb 2023 is no longer configured for 2D scenes, users must adjust system settings for the viewing of 3D scenes. See **Appendix C**, section *C.3 Settings for 3D Scenes*.
- **4.** Certain database items from legacy databases must be adjusted or rebuilt when coming into MLWeb 2023. See **Appendix C**, section *C.4 Migrating Reports, Charts, and Scenes.*

For users with a legacy version of MLSuite on their systems, it is important to complete all of these steps before moving onto the next section of this guide.



Note

Previous generations of MLSuite have required the installation and maintenance of IIS to enable the MLWeb web server. IIS is no longer required as MLWeb 2023 is powered and managed by Microsoft ASP .NET Core Runtime via the .NET framework.

1.3 Pre-Installation Requirements

Several steps must be completed before the installation of MLSuite can begin. Note that these steps apply to full version installations and upgrades, not service pack upgrades.

Required Conditions

- The Windows platform must be fully patched and updated with Microsoft Windows updates. Not having the proper updates will prevent installation of components crucial to the operation of MLSuite.
 - This includes the .NET framework: Version 4.8 must be installed on the computer or server.
 - Windows Firewall must also be enabled. If Windows Firewall is disabled, the installation will fail.
- PostgreSQL must be installed. See section 2.2 Installing PostgreSQL Installer.
- .NET Core 7.0 Web Service Hosting must be installed. See section 2.3 Installing .NET Core Web Server Hosting.
- NodeJS must be installed. See section 2.4 Installing NodeJS.

Additional Pre-Installation Considerations

• If the **firebird.conf** file (**C:\Program Files\MultiLogger\Firebird**) has been edited, the installer will not overwrite the .conf file during installation. To revert an edited file to the default configuration, it is recommended that the firebird.conf file be backed up and deleted before installation of the latest version.



- It is recommended to stop the MLGateway, MLServer, and Firebird services before uninstalling, especially if uninstalling versions of MLSuite older than 2016. Stop MLServer **before** Firebird.
- Folders designated for Firebird and Postgre database files should be created before beginning the installation.
 - Example: C:\Databases\Firebird and C:\Databases\PostgreSQL
- The installer should restart the services automatically, but it is recommended to check that they are running after the installation is complete and the machine has been rebooted. If not, cycle them to ensure that they are running. Start Firebird **before** MLServer.
- An account used by the software to run backend processes should be created. See *Appendix D Creating Canary Process Account* for instructions on creating a Canary Process Account.

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2. Installation

Note

The following example installation shows a new installation of MLSuite 2023 on a 64-bit Windows environment with Admin user rights, unless otherwise specified. The installation process on the operating system may vary (particularly for file locations), especially with desktop operating systems such as Windows 11.

MLSuite with MLWeb 2023 software is available in two formats: a USB flash drive or from a downloaded installer (.msi). The current MLSuite installer is available from the support area of the Canary Systems[®] website at canarysystems.com/support/software-downloads.

The basics steps for the installation process are as follows:

- Install and configure PostgreSQL and add-ons See 2.2 Installing PostgreSQL Installer
- Install .NET Core Web Server Hosting See 2.3 Installing .NET Core Web Server Hosting
- Install NodeJS See 2.4 Installing NodeJS.
- Install MLSuite See 2.5 Installing MLSuite

Note

Previous editions of the MLSuite installer have required the manual installation of Microsoft Visual C++ components as a preliminary step. These components are now included with the installation of PostgreSQL and add-ons.

2.1 Installing PostgreSQL Installer

PostgreSQL is a cross-platform database management tool used by MLSuite for storing and processing 3D data. It is recommended that PostgreSQL, along with the Firebird SQL server, be kept on a separate, dedicated database SSD, or even a separate machine from that which MLSuite is installed on. Contact Canary Systems for help determining the optimal setup for your project.

Note

In order to install PostgreSQL, the user must have Admin user rights on Windows.

2.1.1 Downloading the PostgreSQL Installer

The PostgreSQL installer for Windows is available online and can be found on the Canary Systems website under Third Party Downloads & Utilities (canarysystems.com/support/software-downloads).



Click **Download the installer** for a list of available PostgreSQL Versions.

Home About Download	Documentation Community Developed	s Support Donate Your account	Search for	۹ (
		25th May 2023: <u>PostgreSQL 16 Beta 1 Released</u> !					
Quick Links	Windows installer	s 📕					
 Downloads Packages 	Interactive installer by	/ EDB					
 Source Software Catalogue 	Download the installer certified by	EDB for all supported PostgreSQL versions.					
File Browser	Note! This installer is hosted by EDE	and not on the PostgreSQL community servers. If you have iss	ues with the website it's hosted on, please contact webmaster@enterpris	edb.com.			
This installer includes the PostgreSQL server, pgAdmin; a graphical tool for managing and developing your databases, and StackBuilder; a package manage download and install additional PostgreSQL tools and drivers. Stackbuilder includes management, integration, migration, replication, geospatial, connecto							
	This installer can run in graphical or	silent install modes.					
	The installer is designed to be a stra	ghtforward, fast way to get up and running with PostgreSQL on	Windows.				
	Advanced users can also download a installer.	zip archive of the binaries, without the installer. This download	d is intended for users who wish to include PostgreSQL as part of another	application			
	Platform support						
	The installers are tested by EDB on the following platforms. They can generally be expected to run on other comparable versions, for example, desktop releases of Windows:						
	PostgreSQL Version	64 Bit Windows Platforms	32 Bit Windows Platforms				
	15	2019, 2016					
	14	2019, 2016					
	13	2019, 2016					
	12	2019, 2016, 2012 R2					
	11	2019, 2016, 2012 R2					
	10	2016, 2012 R2 & R1, 7, 8, 10	2008 R1, 7, 8, 10				

Select the latest version 13 of PostgreSQL and download the installer for the correct operating system.



PostgreSQL Version		Linux x86-64	Linux x86-32	Mac OS X	Windows x86-64	Windows x86-32
	15.3	postgresql.org 🗹	postgresql.org ^亿	ė	Ċ	Not supported
	14.8	postgresql.org 🗗	postgresql.org 🗗	Ú.	<u>ė</u>	Not supported
	13.11	postgresql.org 더	postgresql.org 🗗	ė	Ù	Not supported
	12.15	postgresql.org 岱	postgresql.org 🗗	ė	Ċ	Not supported
	11.20	postgresql.org 🗗	postgresql.org 🗗	Ċ.	Ċ.	Not supported
	10.23*	Ú	ė	ė	ė	Ċ.

2.1.2 PostgreSQL and Add-on Installation

There are several steps required during the installation of PostgreSQL, including customizing settings and enabling addons.



PostgreSQL Installation Steps

- **1.** Run the PostgreSQL installer.
- 2. On the initial page, click **Next**.

Setup		-		×
PACKAGED BY	Setup - PostgreSQL			
😳 EDB	Welcome to the PostgreSQL Setup Wizard.			
60				
Caller				
PostgreSQL				
			_	
	< Back Ne	ext >	Can	cel

3. The **Setup** wizard displays the default **Installation Directory** path. The default location can be left, or an alternative drive can be selected. Click **Next**.

Setup	_	
Installation Directory		
Please specify the directory where PostgreSQL will be installed. Installation Directory C: Program Files PostgreSQL 13		
VMware InstallBuilder	Next >	Cancel

4. Ensure that all components are checked on the **Select Components** page. Click **Next**.



Hint

The Stack Builder option requires internet access. If the server the installer is being run on does not have internet access, contact Canary Systems.

5. Update the Data Directory location. The Data Directory specifies the path where all PostgreSQL data is stored.

If a PostgreSQL database folder does not already exist, one should be created: **Create a new "Databases" folder with** a **"PostgreSQL" subfolder**.



- b) Select the PostgreSQL folder
- c) Click Select Folder



截 Setup		_				
Data Directory			-			
Please select a directory under which to st Data Directory [:]Program Files\PostgreS0	tore your data. 2L\13\data					
	🧃 Select Folder					×
	← → ~ ↑ □ « ost	() → Databas	es v	· Ö Search Databases		Q
	Organize 👻 New folder					?
	V 📌 Ouick access		Name	Date modified	Туре	
	Desktop	*	PostgreSQL	1/4/2022 3:02 PM	File folder	
	Downloads	А.				
VMware InstallBuilder	Documents	*				
	Pictures	A				
	> retwork	<				>
	Folder	PostgreSQL				
				Select Folder	Cancel	

6. After the new directory has been selected, click **Next**.

🗃 Setup		-		×
Data Directory				
Please select a directory under which to store your data. Data Directory C:\Databases\PostgreSQL	69			
VMware InstallBuilder	< Back	Next >	Cano	:el

7. On the **Password** page of the Setup wizard, the postgres superuser password must be set. Enter a password and click **Next**.





🗃 Setup	_		×
Password			
Please provide a password for the database superuser (postgres). Password Retype password			
InstallBuilder Sadk N	ext >	Cano	cel

- 8. Keep the default **Port** setting and click **Next**.
- 9. Keep the default Locale setting and click Next.
- 10. Click Next on the Pre-Installation Summary page.
- **11.** Click **Next** on the **Ready to Install** page to begin the PostgreSQL installation. This may take a few minutes to complete the installation.

Stack Builder Component Selection and Setup

1. When the installation is complete, the Setup wizard opens a dialog box where **Stack Builder**, which allows for additional third-party PostgreSQL plugins such as PostGIS, can be enabled or disabled. Ensure that it is **enabled** (checkbox is checked), then click **Finish** to open the Stack Builder wizard.





2. Select the **PostgreSQL** database and port from the **Stack Builder** drop-down and click **Next**.



- **3.** From the list of available applications:
 - a) Expand the **Database Drivers** group and select **Npgsql**, this allows MLWeb and .NET services to connect to the PostgreSQL databases.
 - b) Then expand the **Spatial Extensions group** and select the **PostGIS 3.3 Bundle** option.
 - c) Click Next.

😂 Stack Builder 4.2.1		×
Stack Builder 4.2.1	Please select the applications you would like to install.	×
	Postols 3.3.3 bundle includes Postols 3.3.3 w GDAL 3.0.4 (SQLite 3.30.1, OpenJPEG 2.4.0, Expat 2.4.8, FreeXL 1.0.6), GEOS 3.11.2, Proj 8.2.1, providing 3.5.0, expanding 2.3.8, our fdw 1.1.3 spatial foreign data	Ĵ
	< Back Next > Cance	:

4. On the next page, the default path for the **Download directory** should not be changed. Click **Next**.



Note

If at this stage you get a Checksum verification failed error, complete the following remedial steps:

- 1. Click **OK** to close the Stack Builder Error window.
- 2. From the Stack Builder wizard, click **< Back** to return to the previous window.
- 3. Deselect the option for the PostGIS 3.3 Bundle, leaving only Npgsql v3.2.6-3 selected. **Click Next >**.
- 4. Click **Next** > again. This brings you to step 5 of the main list. Complete steps 5-7 to finish setup of the Npgsql component.
- Once complete, go to <u>https://ftp.postgresql.org/pub/postgis/pg13/v3.3.3/win64/postgis-</u> <u>bundle-pg13x64-setup-3.3.3-1.exe</u> to download the Postgis bundle directly. Open and then start from PostGIS Installation Step 1 of this guide.
- **5.** Once the applications download, click **Next** on this page and the following page to continue setup of the applications. **Do not check Skip Installation**.
- 6. The first component to be configured is **Npgsql**. The default Installation Directory should be used, click through and finish setup of Npgsql.
- 7. Click **Finish** to close the setup dialog and open the PostGIS installer.

PostGIS Installation

PostGIS is a program that adds enhanced support for spatial queries to the PostgreSQL object-relational database.

1. Read through the License Agreement and click **I Agree** to continue with the installation.

ess Page Down to see the rest of the agreement. GNU GENERAL PUBLIC LICENSE	
ess Page Down to see the rest of the agreement. GNU GENERAL PUBLIC LICENSE	
GNU GENERAL PUBLIC LICENSE	
Version 2 June 1001	1
or this license document, but changing it is not allowed. Preamble	
The licenses for most software are designed to take away your	
you accept the terms of the agreement, dick I Agree to continue. You must accep	t the



- 2. On the Choose Components page, use the default settings (only PostGIS is checked) and click Next.
- 3. Leave the default Destination Folder path as the Choose Install Location and click Next to install PostGIS.
- **4.** After installation, multiple dialog boxes display asking to register the environment variables, set PostGIS enabled drivers to common drivers, and enable out of db rasters. Click **Yes** for all.

PostGIS Bundle 3.3.3 for PostgreSQ	L x64 13 Setup	×
Would you like us to register the PRO you, needed for geometry and raster t This will overwrite existing settings if y	J_LIB environment var ransformation to wor you have them.	iable for rk properly?
	Yes	No

5. After clicking **Yes** on the last dialog box, a message indicating the installation is complete is displayed. Click **Close** and then click **Finish**.

PostgreSQL and add-ons have been successfully installed. PostgreSQL must now be configured. See the following section for configuration details.

2.1.3 Configuring PostgreSQL

To optimize performance, PostgreSQL should be configured for the specific operating system and hardware it is installed on. Tools available online can provide optimal settings for PostgreSQL for the system it is installed on. These settings can be updated in the **postgresql.auto.conf** configuration file.

Generating Configurations

Canary Systems recommends *PGTune* for PostgreSQL configurations. The PGTune link is available on the Canary Systems website under Third Party Downloads & Utilities: <u>canarysystems.com/support/software-downloads</u>

On the left of the PGTune website, the system parameters are entered:

- **DB Version** The version of PostgreSQL installed.
- **OS Type** The machine's operating system.
- **DB Type** The application of the PostgreSQL database.
- Total Memory (RAM) Maximum memory available for PostgreSQL. (This should not exceed 16)
- Number of CPUs Number of cores, including virtual cores.
- Number of Connections Optional, usually left blank.
- Hard drive type Drive type.



After entering your system parameters, press the **Generate** button.

Home	How	/ it works
		PGTune
Parameters of	your system	You need provide basic information about your
DB version	what is this?	hardware configuration, where is working PostgreSQL
13		database. Results will be calculated after clicking "Generate" button
OS Type	what is this?	More information about "DB Type" setting:
Windows		Web Application (web)
DB Type	what is this?	 Typically CPU-bound DB much smaller than RAM 90% or more simple queries
		Online Transaction Processing (oltp)
Total Memory (RAM) 16	what is this?	 Typically CPU- or I/O-bound DB slightly larger than RAM to 1TB 20-40% small data write queries Some long transactions and complex read queries
Number of CPUs	what is this?	• Data Warehouse (dw)
8 Number of Connections	what is this?	 Typically I/O- or RAM-bound Large bulk loads of data Large complex reporting queries Also called "Decision Support" or "Business Intelligence"
Number of Connectio	ns (optional)	 Desktop application
Data Storage	what is this?	 Not a dedicated database A general workstation, perhaps for a developer
SSD storage		 Mixed type of application
Gener	ate	 Mixed DW and OLTP characteristics A wide mixture of queries

The configurations are then generated and displayed to the right as either **postgresql.conf** configurations or **ALTER SYSTEM** configurations.

Select **postgresql.conf** and **Copy configuration**.

Home	How it	t works	
	\bigcirc	PGTune	
Parameters of	your system		
DB version	what is this?	postgresql.conf	ALIER SYSTEM
13		Add/modify this settings in	ostaresal.conf and
OS Type	what is this?	restart database	
Windows		# DB Version: 13	
DB Туре	what is this?	<pre># OS Type: windows # DB Type: web # Total Memory (RAM): 16 GB</pre>	
Web application		<pre># CPUs num: 8 # Data Storage: ssd</pre>	
Total Memory (RAM)	what is this?	<pre>max_connections = 200</pre>	
16	GB	shared_buffers = 4GB	
Number of CPUs	what is this?	<pre>maintenance_work_mem = 1GB checkpoint_completion_targe</pre>	t = 0.9
8		<pre>wal_buffers = 16MB default statistics target =</pre>	100
Number of Connections	what is this?	<pre>random_page_cost = 1.1 work_mem = 5242kB</pre>	
Number of Connection	ons (optional)	<pre>min_wal_size = 1GB max_wal_size = 4GB</pre>	
Data Storage	what is this?	<pre>max_worker_processes = 8 max_parallel_workers_per_ga max_parallel_workers = 8</pre>	ther = 4
SSD Storage		<pre>max_parallel_maintenance_wo</pre>	rkers = 4
Gene	rate	Copy confi	guration



Updating the PostgreSQL Auto Configuration File

The PostgreSQL files are located in the **Data Directory**, the path specified during the PostgreSQL installation, refer to step 5 in *2.2.2 PostgreSQL and Add-On Installation*.

There are two configuration files for PostgreSQL; **postgresql.auto.conf** and **postgresql.conf**.

It is recommended that you edit the **postgresql.auto.conf** which is typically empty. In the case where there are conflicting entries in both **postgresql.conf** and **postgresql.auto.conf** the value in the **postgresql.auto.conf** take precedence.

📕 💆 📙 🖛 PostgreSQL			_	
File Home Share View				~ 🕐
← → < ↑ 📙 > This PC > Windows	s (C:) > Databases > P	ostgreSQL →	✓ 🖸 Search PostgreSQL	م
Name	✓ Date modified	Туре	Size	^
pg_tblspc	10/26/2018 11:39	File folder		
pg_twophase	10/26/2018 11:39	File folder		
pg_wal	11/7/2018 10:33 AM	File folder		
pg_xact	10/26/2018 11:39	File folder		
current_logfiles	11/6/2018 3:02 PM	File	1 KB	
pg_hba.conf	10/29/2018 10:50	CONF File	5 KB	
pg_ident.conf	10/26/2018 11:39	CONF File	2 KB	
PG VERSION	10/26/2018 11:39	File	1 KB	
postgresql.auto.conf	11/5/2018 1:19 PM	CONF File	1 KB	
postgresql.conf	10/26/2018 11:39	CONF File	23 KB	
postmaster.opts	11/5/2018 1:57 PM	OPTS File	1 KB	
postmaster.pid	11/5/2018 1:57 PM	PID File	1 KB	~
26 items				

1. Open the file using a simple text editor (Canary Systems recommends Notepad++).

Note

There is verbiage at the top of the postgresql.auto.conf file that reads, "Do not edit this file manually!" It is safe to ignore this message and proceed.



2. Paste the configuration generated by PGTune into the **postgresql.auto.conf** file as shown in the figure below.

1	<pre># Do not edit this file manually!</pre>
2	# It will be overwritten by the ALTER SYSTEM command.
3	
4	# DB Version: 13
5	# OS Type: windows
6	# DB Type: web
7	# Total Memory (RAM): 16 GB
8	# CPUs num: 8
9	# Data Storage: ssd
10	
11	<pre>max_connections = 200</pre>
12	shared buffers = 4GB
13	effective_cache_size = 12GB
14	<pre>maintenance_work_mem = 1GB</pre>
15	<pre>checkpoint_completion_target = 0.9</pre>
16	<pre>wal_buffers = 16MB</pre>
17	default_statistics_target = 100
18	<pre>random_page_cost = 1.1</pre>
19	work_mem = 5242kB
20	<pre>min_wal_size = 1GB</pre>
21	<pre>max_wal_size = 4GB</pre>
22	<pre>max_worker_processes = 8</pre>
23	<pre>max_parallel_workers_per_gather = 4</pre>
24	<pre>max_parallel_workers = 8</pre>
25	<pre>max_parallel_maintenance_workers = 4</pre>

- **3. Save** and close the posgresql.auto.conf file.
- 4. Open Windows Services and Restart the PostgreSQL service.

Services							-	×
File Action View	Help							
(= =) 🔂 🖂	2 🛃 🚺 📷 🕨 🔳 🕪 🕨							
🔍 Services (Local)	Services (Local)							
	postgresql-x64-13	Name	Description	Status	Startup Type	Log On As		^
I	Stop the service Pause the service Restart the service Description: Provides relational database storage.	MONIA Display Container LS Offline Files Offline Files Offline Files OpenSNH Authentication A OpenSNH Authentication A OpenSNH Authentication A OpenSNH Authentication A Perental Controls Permental Controls Permethal Contrel Permethal Controls Permethal Controls Permethal Con	Container s The Offline Keeps your Agent to ho Enforces pa Enables serv Enables serv Enables mul Provides ide Enables rem Performanc Manages th Enables a c This service	Running	Automatic Manual (Trig Disabled Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual Manual	Local Syste Local Syste Local Syste Local Syste Local Syste Local Syste Local Service Local Service		
	Г	Portable Device Enumerator	Enforces gr	Rupping	Manual (Trig	Local Syste		
	L .	Power	Manages p	Running	Automatic	Local Syste		
		Print Spooler	This service	Running	Automatic	Local Syste		
		Printer Extensions and Notif	This service		Manual	Local Syste		
		PrintWorkflow_f0a00	Provides su		Manual (Trig	Local Syste		
		Reading Description Constrail Do	This convice		Manual	Local Surto		~

If the Restart fails, see *Troubleshooting* at the end of this Section.

Once the PostgreSQL service has been successfully restarted, continue to *PostgreSQL Client Authentication Configuration File.*



PostgreSQL Client Authentication Configuration File

The **pg_hba.conf** file must be edited to allow non-local connections to the PostgreSQL database. The **pg_hba.conf** file is located in the same directory as the **postgresql.auto.conf** file.

Open the **pg_hba.conf** file and scroll all the way to the end of the file. These default settings allow connections to the local database from the same local machine only.

In order to allow remote connections (i.e. in order to allow MLServer service to connect to the database from a different location), add the IPv4 and IPv6 addresses of all servers where PosgreSQL and MLServer components are installed, followed by "/32" for IPv4 or "/128" for IPv6.



The IPv4 and IPv6 addresses can be retrieved by running ipconfig on the server hosting MLWeb. To do this, open Command Prompt and enter "ipconfig."

# #	Put	your actual conf	iguration here		
# # # #	If yo "host liste conf:	ou want to allow t" records. In en on a non-loca iguration parame	non-local conne that case you wi il interface via ter, or via the	ections, you need to add more ill also need to make PostgreSQL the listen_addresses -i or -h command line switches.	
#	TYPE	DATABASE	USER	ADDRESS	METHOD
#	IPv4	local connectio	ons:		
ho	ost	all	all	127.0.0.1/32	md5
h	ost	all	all	172.25.10.62/32	md5
#	IPv6	local connectio	ons:		
ho	ost	all	all	::1/128	md5
h	ost	all	all	fe80::95f3:4ed7:d1:f047%4/128	md5
#	Allo	w replication co	nnections from I	localhost, by a user with the	
#	repl:	ication privileg	e.		
h	ost	replication	all	127.0.0.1/32	md5
ho	ost	replication	all	::1/128	md5

Troubleshooting

If PostgreSQL service cannot be restarted, a setting generated by PGTune may be invalid. This can be due to a simple typo when copying over the PGTune settings. Keep in mind that the settings are case-sensitive, so common issues to watch for are the use of KB vs. kB, MB vs.GB, and the correct application of # comment tags. The figure below shows the error that is displayed when a restart is attempted when a postgresql.auto.conf configuration value is invalid.





Other common issues may be related to:

- An incorrect maintenance_work_mem configuration. It may need to be lowered before PostgreSQL can be restarted.
- Or the total memory being set too high in the PGTune. Anything higher than 16GB is likely to cause issues.

2.2 Firewall Configuration

New firewall rules are required for **each** of the following instances:

- If the PostgreSQL database is installed on a server separate from other MLSuite components
- If MLWeb or MLAdmin must be accessed remotely

The process for adding each of these rules is similar (but must be done separately). See the respective subsections for each below. Any users without the need for these rules may skip ahead to section 2.3 Installing .NET Core Web Server Hosting.

PostgreSQL Database on a Separate Server

1. On the server where PostgreSQL is installed, open the **Windows Firewall and Advanced Security** management console.





2. Select **Inbound Rules** from the menu on the left and then create a new rule by selecting **New Rule** from the **Actions** menu on the right. This opens the New Inbound Rule Wizard.

P Windows Firewall with A	dvanc	ed Security														-	×
File Action View Help)																
🗢 🄿 🗖 📷 🗟 🛙																	
Windows Firewall with Ad	lvance	Inbound Rules													Actions		
Cutbound Rules		Name	Group	Profile	Ena	Action	Ove	Progr	Local A	Remote Add	Protocol	Local	Remote	^	Inbound Rules		^ ^
🚡 Connection Security I	Rules	🚱 Firebird Database Server		All	Yes	Allow	No	C:\Pro	Any	Any	тср	3050	Any		🐹 New Rule		
> 🔜 Monitoring		 Firefox (C:\Program Fi Firefox (C:\Program Fi 		Private Private	Yes Yes	Allow Allow	No No	C:\Pro C:\Pro	Any Any	Any Any	UDP TCP	Any Any	Any Any		Filter by Profile		•
		🛛 Microsoft Lync		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		Filter by State		
		🛛 🖉 Microsoft Lync UcMapi		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		Filter by Group		•
		🔮 Multilogger: MLGatew		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any		View		•
		Multilogger: MLProce Multilogger: MLServer		All	Yes Yes	Allow	No No	System C:\Pro	Any Any	Any Any	TCP TCP	Any Any	Any Any		Refresh		
		AllJoyn Router (TCP-In)	AllJoyn R	Domai	Yes	Allow	No	%Syst	Any	Any	ICP	9955	Any				
		Alloyn Kouter (UDP-In)	Alboyn K	Domai	Yes	Allow	NO No	%Syst	Any	Any	TCD	Any	Any		👔 Help		
		BranchCache Hosted	BranchCa		No	Allow	No	SYSTEM	Any Any	Any	TCP	80 443	Any Any		Firebird Database Server		
		BranchCache Peer Dis	BranchCa	All	No	Allow	No	%syst	Any	Local subnet	UDP	3702	Any		Disable Rule		_
		🛛 🖉 Cast to Device functio	Cast to D	Private	Yes	Allow	No	%Syst	Any	PlayTo Rend	TCP	2177	Any	~	🖌 Cut		
<	>	<											>				~

- 3. Configure the firewall rule using the New Inbound Rule Wizard.
 - a) Select **Port** as the **Rule Type** and click **Next**.

💣 New Inbound Rule Wizard		×
Rule Type		
Select the type of firewall rule to cr	eate.	
Steps: Protocol and Ports Action Profile Name	What type of rule would you like to create? Program Rule that controls connections for a program. Protefined: Alloyn Router Rule that controls connections for a Windows experience. C Custom Custom rule.	
	< Back Next > Cancel	



b) On the **Protocol and Ports** tab select **TCP** and **Specific local ports**, then set the local port to "5432." Click **Next**.

💣 New Inbound Rule Wizard			×
Protocol and Ports			
Specify the protocols and ports to	which this rule applies.		
Steps:	Does this rule apply to TCP or L	IDP2	
Rule Type Protocol and Ports			
Action			
Profile			
Name	Does this rule apply to all local p	oorts or specific local ports?	
	All local ports		
	Specific local ports:	5432	
		Example: 80, 443, 5000-5010	
		< Back Next > Cancel	

c) On the **Action** tab, select **Allow the connection** and click **Next**.

Action		
pecify the action to be taken v	vhen a connection matches the conditions specified in the rule.	
teps:		
Rule Type	What action should be taken when a connection matches the specified conditions?	
Protocol and Ports	Allow the connection	
Action	This includes connections that are protected with IPsec as well as those are not.	
Profile		
Name	Allow the connection if it is secure This is been and the been and the birth of the second terms of term	
	Inits inculaes only connections that have been authenticated by using insec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.	
	Customize	
	Block the connection	
	(Back Next > Cance	



d) On the **Profile** tab, leave all check boxes selected and click **Next**.

💣 New Inbound Rule Wizard		×
Profile		
Specify the profiles for which this n	ule applies.	
Steps:		
Rule Type	When does this rule apply?	
Action	Domain	
Profile	Applies when a computer is connected to its corporate domain.	
Name	Private Applies when a computer is connected to a private network location, such as a home or work place. Public Applies when a computer is connected to a public network location.	

e) In the **Name** field, give your new rule a name and then click **Finish**.

🔗 New Inbound Rule Wizard		×
Name		
Specify the name and description of	this rule.	
Steps:		
Rule Type		
Protocol and Ports		
Action		
Profile	Name: Poetors SOL	
Name	1 Usigre Jacq	
	Description (optional):	
	< Back Finish Cancel	

- 4. Once the new rule has been created, additional settings must be configured.
 - a) Locate the new rule in the Inbound Rule table and double click it to open the **Properties** form.

🔗 Windows Firewall with Advance	ed Security														-	×
File Action View Help																
🗢 🄿 🙍 📰 🗟 🖬																
Hindows Firewall with Advance	Inbound Rules													Actions		
Cuthound Rules	Name	Group	Profile	Ena	Action	Ove	Progr	Local A	Remote Add	Protocol	Local	Remote	^	Inbound Rules		^
Connection Security Rules	😵 PostgreSQL		All	Yes	Allow	No	Any	Any	Any	тср	5432	Any		🚉 New Rule		
> 🛼 Monitoring	🥑 Firebird Database Server		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	3050	Any		Filter by Profile		•
	🔮 Firefox (C:\Program Fi		Private	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any				
	🔮 Firefox (C:\Program Fi		Private	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any		Y Filter by State		
	🐼 Microsoft Lync		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		Filter by Group		•
	🐼 Microsoft Lync UcMapi		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		View		•
	🛿 Multilogger: MLGatew		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any		Back		
	🛛 Multilogger: MLProce		All	Yes	Allow	No	System	Any	Any	TCP	Any	Any		G Refresh		
	Multilogger: MLServer		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any		Export List		
	AllJoyn Router (TCP-In)	AllJoyn R	Domai	Yes	Allow	No	%Syst	Any	Any	ТСР	9955	Any		Help		
	AllJoyn Router (UDP-In)	AllJoyn R	Domai	Yes	Allow	No	%Syst	Any	Any	UDP	Any	Any	~			_
< >	<											>		PostgreSQL		▲ ↓

- b) From the Properties form, select to the **Scope** tab.
- c) The Local IP address can be left as Any IP address. However, the Remote IP address should be specified.
 - i. Select These IP Addresses: and click Add...

General	Program	ms and Services	Remot	e Computers
Protocols and P	orts Scope	Advanced	Local Principals	Remote Usen
Local IP add	ress Any IP address These IP addre	esses:	Add	
Remote IP a	ddress Any IP address These IP addre	esses:	Remove	
			Add Edit Remove	

ii. The IP address for each server that is hosting MLSuite components that will communicate with the PostgreSQL server must be added. Type in the IP and click **OK**.



iii. Repeat for each IP address.

IP Address	\times
Specify the IP addresses to match:	
This IP address or subnet:	_
Examples: 192.168.0.12 192.168.1.0/24 2002:9d3b:1a31:4:208:74ff.fe39:6c43 2002:9d3b:1a31:4:208:74ff.fe39:0/112	
O This IP address range:	
From:	
To:	
O Predefined set of computers:	
Default gateway	\sim
OK Canc	el

iv. Once all the necessary IP addresses have been added click **Apply** and **OK**.

PostgreSQL Prope	rties			×
General	Programs	and Services	Remo	te Computers
Protocols and Port	s Scope	Advanced	Local Principals	Remote Users
Local IP addres	s			
е (О А С Т	ny IP address hese IP address	ses:		
			Add	
			Edit	
			Remove	
Remote IP addr	ress			
📕 🔿 A	ny IP address			
۰ آ	hese IP address	ses:		
6	7.212.86.118 7.212.86.117		Add	
			Edit	
			Remove	
		ОК	Cancel	Apply



The allowed IP addresses are shown under Remote Addresses for the new Inbound Rule.

🔗 Windows Firewall with Advance	ed Security												- 0	×
File Action View Help														
🗢 🔿 🙇 🖬 🗟 🖬														
P Windows Firewall with Advance	Inbound Rules											Actions		
Inbound Rules	Name Gro	up Profile	Ena	Action	Ove	Progr	Loc	Remote Address	Protocol	Local	^	Inbound Rules		•
Connection Security Rules	🔮 PostgreSQL	All	Yes	Allow	No	Any	Any	67.212.86.118, 67.212.86.117	тср	5432		🗱 New Rule		
> 🔜 Monitoring	Firebird Database Server	All	Yes	Allow	No	C:\Pro	Any	Any	TCP	3050		Y Filter by Profile		•
	Firefox (C:\Program Fi	Private	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any		V Filter by State		
	Firefox (C:\Program Fi	Private	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any		a miler by state		
	🐼 Microsoft Lync	Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any		Y Filter by Group		•
	🔮 Microsoft Lync UcMapi	Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any		View		•
	🕑 Multilogger: MLGatew	All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any		Defeet		
	🔮 Multilogger: MLProce	All	Yes	Allow	No	System	Any	Any	TCP	Any		G Kerresn		
	🐼 Multilogger: MLServer	All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any		Export List		
	🔮 AllJoyn Router (TCP-In) 🛛 AllJi	oyn R Domai.	. Yes	Allow	No	%Syst	Any	Any	тср	9955		Help		
	🔮 AllJoyn Router (UDP-In) 🛛 AllJ	oyn R Domai.	. Yes	Allow	No	%Syst	Any	Any	UDP	Any	~			
< >	<										>			
	0													

MLWeb or MLAdmin to be Accessed Remotely

1. On the server where MLSuite is installed, open the **Windows Firewall and Advanced Security** management console.



2. Select **Inbound Rules** from the menu on the left and then create a new rule by selecting **New Rule** from the **Actions** menu on the right. This opens the New Inbound Rule Wizard.

1	P Windows Firewall with Advance	d Security													-	-	٥	×
F	File Action View Help																	
4	Þ 🔿 🙍 📷 🗟 🔽 📷																	
1	Windows Firewall with Advance	Inbound Rules													Actions			
	Cutbound Rules	Name	Group	Profile	Ena	Action	Ove	Progr	Local A	Remote Add	Protocol	Local	Remote	^	Inbound Rules		-	• ^
L	Connection Security Rules	😵 Firebird Database Server		All	Yes	Allow	No	C:\Pro	Any	Any	ТСР	3050	Any		🐹 New Rule			
>	Monitoring	 Firefox (C:\Program Fi Firefox (C:\Program Fi 		Private Private	Yes Yes	Allow	No No	C:\Pro C:\Pro	Any Any	Any Any	UDP TCP	Any Any	Any Any		Filter by Profile		I	
L		Microsoft Lync		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		T			
L		Microsoft Lync UcMapi		Domain	Yes	Allow	No	C:\Pro	Any	Any	UDP	Any	Any		Y Filter by Group			'
L		Multilogger: MLGatew		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any		View			•
L		Multilogger: MLProce		All	Yes	Allow	No	System	Any	Any	TCP	Any	Any		Refresh			
L		Multilogger: MLServer		All	Yes	Allow	No	C:\Pro	Any	Any	TCP	Any	Any					
L		AllJoyn Router (TCP-In)	AllJoyn R	Domai	Yes	Allow	No	%Syst	Any	Any	TCP	9955	Any		Export List			
L		🔮 AllJoyn Router (UDP-In)	AllJoyn R	Domai	Yes	Allow	No	%Syst	Any	Any	UDP	Any	Any		? Help			
L		BranchCache Content	BranchCa	All	No	Allow	No	SYSTEM	Any	Any	TCP	80	Any		Eisebied Database Server			
L		BranchCache Hosted	BranchCa	All	No	Allow	No	SYSTEM	Any	Any	TCP	80, 443	Any		Prieditu Database server			
L		BranchCache Peer Dis	BranchCa	All	No	Allow	No	%syst	Any	Local subnet	UDP	3702	Any		Disable Rule			
		Cast to Device functio	Cast to D	Private	Yes	Allow	No	%Syst	Any	PlayTo Rend	TCP	2177	Any	~	🤏 Cut			
<u> </u>	>	<											>					~



- 3. Configure the firewall rule using the New Inbound Rule Wizard.
 - a) Select **Port** as the **Rule Type** and click **Next**.

🔗 New Inbound Rule Wizard		×
Rule Type		
Select the type of firewall rule to cr	eate.	
Steps:		
 Rule Type 	What type of rule would you like to create?	
 Protocol and Ports Action Profile Name 	 Program Rule that controls connections for a program. P Pol Rule that controls connections for a TCP or UDP port. Prodefined: Alloyn Router Rule that controls connections for a Windows experience. C statom Custom rule. 	el

b) On the **Protocol and Ports** tab select **TCP** and **Specific local ports**, then set the local port to "80" (or "443" for https). Click **Next**.

🔗 New Inbound Rule Wizard		×
Protocol and Ports		
Specify the protocols and ports to v	which this rule applies.	
Steps:		
Rule Type	Does this rule apply to TCP or U	DP?
Protocol and Ports	TCP	
 Action 		
Profile		
Name	Does this rule apply to all local p	orts or specific local ports?
	All local ports	
	Specific local ports:	80
		Example: 80, 443, 5000-5010
		(Beals Needs Connel
		< back Next > Cancel



c) On the **Action** tab, select **Allow the connection** and click **Next**.

Pww Inbound Rule Wizard		×
Action		
Specify the action to be taken whe	en a connection matches the conditions specified in the rule.	
Steps:		
Rule Type	What action should be taken when a connection matches the specified conditions?	
Protocol and Ports	Allow the connection	
Action	This includes connections that are protected with IPsec as well as those are not.	
Profile	○ Allow the connection if it is secure	
• Name	 Allow the connection if it is secure This includes only connections that have been authenticated by using IPsec. Connections were authenticated by using IPsec. Connections Security Rule node. Customze Block the connection 	
	< Back Next > Cancel	

d) On the **Profile** tab, leave all check boxes selected and click **Next**.

🔗 New Inbound Rule Wiza	rd	>
Profile		
Specify the profiles for which th	is rule applies.	
Steps:		
Rule Type	When does this rule apply?	
Protocol and Ports		
Action	✓ Domain	
Profile	Applies when a computer is connected to its corporate domain.	
Name	Private	
	Applies when a computer is connected to a private network location, such as a home or work place.	
	✓ Public	
	Applies when a computer is connected to a public network location.	
	(Berly Netty Core	


e) In the **Name** field, give your new rule a name and then click **Finish**.

1	P New Inbound Rule Wizard			×
N	lame			
Sp	ecify the name and description of	of this rule.		
S	leps:			
•	Rule Type			
•	Protocol and Ports			
•	Action			
•	Profile		Name: MI Web Remote Access	
۲	Name		MEAVED Nemole Access	
			Description (optional):	
			< Back Finish Cancel	

- 4. Once the new rule has been created, additional settings must be configured.
 - a) Locate the new rule in the Inbound Rule table and double click it to open the **Properties** form.

🔗 Windows Defender Firewall with Adva	nced Security								– 🗆 X
File Action View Help									
◆ ⇒ 🖄 🖬 🗟 🖬									
P Windows Defender Firewall with Adva	Inbound Rules								Actions
Cuthound Rules	Name	Group	Profile	Enabled	Action	Override	Program	Local Address	Inbound Rules
Source Connection Security Rules	MLWeb Remote Access		All	Yes	Allow	No	Any	Any	ka New Rule
> 🐱 Monitoring	FileMaker Pro 18 Advanced		Private	Yes	Allow	No	C:\progr	Any	Filter by Profile
	FileMaker Pro 18 Advanced		Private	Yes	Allow	No	C:\progr	Any	V Filter by State
	V Firebird Database Server		All	Yes	Allow	No	C:\Progr	Any	
	Microsoft Office Outlook		Public	Yes	Allow	No	C:\Progr	Any	Y Filter by Group
	Multilogger: MLGateway		All	Yes	Allow	No	C:\Progr	Any	View 🕨
	Multilogger: MLServer		All	Yes	Allow	No	C:\Progr	Any	Q Refresh
	Multilogger: MLWeb Service		All	Yes	Allow	No	C:\Progr	Any	Event list
	V teams.exe		Public	Yes	Block	No	C:\users\	Any	Export List
	teams.exe		Public	Yes	Allow	No	C:\users\	Any	P Help
	🚫 teams.exe		Public	Yes	Block	No	C:\users\	Any	MIWeb Remote Access
	🔮 teams.exe		Public	Yes	Allow	No	C:\users\	Any	
	TechSmith Camtasia 2020		All	Yes	Allow	No	Any	Any	Disable Rule
	@{Microsoft.DesktopAppInstaller_1.0.302	@{Microsoft.DesktopAppIns	Domai	Yes	Allow	No	Any	Any	🔏 Cut
	@{Microsoft.DesktopAppInstaller_1.21.27	@{Microsoft.DesktopAppIns	Domai	Yes	Allow	No	Any	Any 🗸	R Conv
< >	<							>	· · · · · · · · · · · · · · · · · · ·

b) From the Properties form, select to the **Scope** tab.



c) The Local IP address can be left as Any IP address. However, the Remote IP address should be specified.

emote Users

- i. Select These IP Addresses: and click Add...
- ii. The IP address for each server that is hosting MLSuite components that will communicate with the PostgreSQL server must be added. Type in the IP and click **OK**.

IP Address	×
Specify the IP addresses to match:	
This IP address or subnet:	
Examples: 192.168.0.12 192.168.1.0/24 2002:9d3b:1a31:4:208:74ff.fe39:6c43 2002:9d3b:1a31:4:208:74ff.fe39:0/112	
O This IP address range:	
From:	
To:	
O Predefined set of computers:	
Default gateway \sim	
OK Cancel	

iii. Repeat for each IP address.



iv. Once all the necessary IP addresses have been added click **Apply** and **OK**.

Gener	al	Program	s and Services	Rem	ote Computers
Protocols a	and Ports	Scope	Advanced	Local Principals	Remote User
-Local IF	address				
	Any I	P address			
<u> </u>	⊖ Thes	e IP addres	ses:		
				Add	
				7 64 64	_
				Edit	
				Remov	е
Remote	O And	Deddees			
	⊖ Anyi	r address			
	Ines	e IP addres	ses:		_
	67.2	12.86.118		Add	
				Edit	
				Remov	e
				11011101	

P Windows Defender Firewall with Adva	nced Security												-	×
File Action View Help														
🗢 🌩 🙇 📰 🗟 🖬 🖬														
P Windows Defender Firewall with Adva	Inbound Rules											Actions		
Inbound Rules	Name	Group	Profile	Enabled	Action	Override	Program	Local Address	Remote Address	Protocol	Local Port ^	Inbound Rules		
Connection Security Bules	MLWeb Remote Access		All	Yes	Allow	No	Any	Any	67.212.86.118	TCP	80	🔯 New Rule		
> 🐱 Monitoring	FileMaker Pro 18 Advanced		Private	Yes	Allow	No	C:\progr	Any	Any	UDP	Any	Filter by Profile		•
	G FileMaker Pro 18 Advanced		Private	Yes	Allow	No	C:\progr	Any	Any	TCP	Any	Filter by State		•
	Microroft Office Outlook		All	Yes	Allow	No	C:\Progr	Any	Any	ICP	3050	Filter by Group		
	Multilogger: MLGateway		All	Yes	Allow	No	C:\Progr	Any	Any	TCP	Any	View		
	Multilogger: MLServer		All	Yes	Allow	No	C:\Progr	Any	Any	TCP	Any			
	Multilogger: MLWeb Service		All	Yes	Allow	No	C:\Progr	Any	Any	TCP	Any	Q Refresh		
	S teams.exe		Public	Yes	Block	No	C:\users\	Any	Any	TCP	Any	Export List		
	🔮 teams.exe		Public	Yes	Allow	No	C:\users\	Any	Any	UDP	Any	🛛 Help		
	🕓 teams.exe		Public	Yes	Block	No	C:\users\	Any	Any	TCD	Any			
	TachSmith Camtaria 2020		All	Ver	Allow	No	C:\users\	Any	Any	TCP	Any 8321			
	@ Microsoft.DesktopAppInstaller 1.0.302	@{Microsoft.DesktopAppIns	Domai	Yes	Allow	No	Any	Any	Any	Any	Any			
	@ @(Microsoft.DesktopAppInstaller_1.21.27	@{Microsoft.DesktopAppIns	Domai	Yes	Allow	No	Any	Any	Any	Any	Any 🗸			
< >>	< l										>			

The allowed IP addresses are shown under Remote Addresses for the new Inbound Rule.

2.3 Installing .NET Core Web Server Hosting

The MLSuite installation processes configures and launches a web server host that is responsible for startup and lifetime management of **MLAdmin**.

Microsoft ASP.NET Core Runtime 7.0 provides the resources for this. Microsoft ASP.NET Core Runtime 7.0 must be downloaded from Microsoft; the **ASP**.**NET Core Runtime Download** link is available on the Canary Systems website under **Third Party Downloads & Utilities** (canarysystems.com/support/software-downloads).





Download the ASP.NET Core Runtime 7.0 (latest version of the Windows Hosting Bundle) as shown below.



Run the installer once downloaded.

2.4 Installing NodeJS

NodeJS is an asynchronous event-driven JavaScript runtime that serves as a supplement to the new charting engine in MLWeb 2023.

To ensure charts render correctly, download the latest version of NodeJS 20.0; a download link is available on the Canary Systems website under **Third Party Downloads & Utilities** (<u>canarysystems.com/support/software-downloads</u>).



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	Node.js® is an open-source, cross-platform JavaScript runtime environment.
	New security releases to be made available August 8th, 2023
	Download for Windows (x64) 18.17.0 LTS Recommended for Most Usar Other Downloads] Changelog API Doce Other Downloads] Changelog API Doce Torinformation about supported releases, see the release schedule.
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Once downloaded, run the installer with default settings. When the installer is finished, restart the server.

2.5 Installing MLSuite

Before launching the MLSuite Installer, ensure that PostgreSQL, Microsoft ASP.NET Core Runtime 7.0.0, NodeJS, and all their associated extensions as detailed in sections 2.2, 2.3, and 2.4 have been installed.

Software Version

The version of the software is included in the installer's name. The year indicates the major release and the following number the service pack. The installer for MLSuite MLWeb 2023 initial release is **MLSuite_2023.1.0.92_x64.msi**.

User Installation Restrictions

MLSuite may be installed on any computer. However, if User Account Controls restrict the installer from making changes, a dialog box will appear asking the user to enter the Administrator's credentials to continue the installation.

MLSuite Setup Wizard

Follow the below steps to complete MLSuite installation. If necessary at any step in the process, click **Cancel** to terminate the installation. Note that this action rolls back all progress made from when the Setup Wizard was launched (not including any manual migration work).



1. To begin, Run the MLSuite Installer. Click **Next** to proceed.



- 2. Read the entire End-User License Agreement (EULA), displaying in the viewing window. It may be printed for later review and reference purposes by clicking the **Print** button.
- 3. Check I accept the terms in the license agreement to indicate agreement.
- Click Next to continue to open the installers Custom Setup wizard, where the application installation options and program file paths can be configured.

Installation Options

Specific applications can be selected for installation by clicking on their icon and changing their installation options, as shown in the figure below. This allows the installer to choose to only install certain features, or not to install others, dependent on server setup and project requirements.

By default, various MLSuite Utilities are installed with the software. For more information on these Utilities, see section 2.5.2 MLSuite Utilities.

🖟 Multilogger Suite 2	2023.0.0 Setup		_		×
Custom Setup Select the way you	u want features to be installe	d.	САЛ	IAF	PY TEMS
Click the icons in th	e tree below to change the v	vay features wil	l be installed.		
	Itilogger Suite Utilogger	Main MLWe This featur your hard	eb application re requires 12: drive.	25MB on	
	 Will be installed on lo Entire feature will be installed 	cal hard drive nstalled on loc	al hard drive:		
L	Entire reature will be up	inavailable		Browse.	
Reset	Disk Usage	Back	Next	Cano	el



From the Custom Setup form, the installer is able to designate the installation path for the program files. The default location is displayed at the bottom of the form, as highlighted in the figure below. Typically, a path in the Program Files folder is used.

🕼 Multilogger Suite 2023.0.0 Setup	– 🗆 X
Custom Setup Select the way you want features to be installed.	
Click the icons in the tree below to change the wa	y features will be installed.
Image: Suite Image: Multilogger Image: MLReport Image: MLReport	All programs required to run MultiLogger Suite on a local machine. This feature requires 2KB on your hard drive. It has 7 of 7 subfeatures selected. The subfeatures require 1655MB on your hard drive.
Location: C:\Program Files\Multilogger\	Browse
Reset Disk Usage	Back Next Cancel

5. Click the Browse button to specify an alternate path if needed.

Additional options are on the installer's Custom Setup wizard include:

Reset - Resets the form to its default options.

Disk Usage – Displays a form showing all available drives, their available storage space and the required storage space for the program and its applications as configured.

6. Click **Next** to continue.



Note

Canary Systems recommends installing MLReport on your local machine. See appendix *B.1 Installing MLRemote Locally* for details on installing MLRemote on your local machine.

- **7.** Before the installation process begins, a settings confirmation screen is displayed. Click **Install** to begin the installation.
- 8. If prompted to allow the installer to make changes to the drive, select **Yes**. The MLSuite program files are then copied to the destination folder.



9. When the installation has been completed successfully, the screen in Figure 2.5 D is displayed. Click **Finish** to complete the installation.

🖟 Multilogger Suite 2023.0.0 Setu	ıp	_		×
2	Completed the Multilogge 2023.0.0 Setup Wizard	r Suite		
c	Click the Finish button to exit the Setu	p Wizard.		
	15'			
	Back Finish		Cance	2

The desktop shortcuts have now been created for MLGateway, MultiLogger, MLServer, MLReport, and MLWebHardware.



Now that MLSuite is installed additional configuration is required. Continue to section 2.6 Creating Firebird Temp Folder.

2.5.1 Modifying the Installation

After initial installation, the same installer can be run again to add or remove MultiLogger features, repair installation errors, or uninstall MLSuite.

🕼 Multilogger Suite 2023.0.0 Setup	_		×					
Change, repair, or remove installation Select the operation you wish to perform.	(CA	NA	RY.					
Change Lets you change the way features are installed.								
Repair Repairs errors in the most recent installation by fix files, shortcuts, and registry entries.	king missing and	corrupt						
Remove Removes Multilogger Suite 2023.0.0 from your computer.								
Back	Next	Cano	cel					



Change – Select this option and click **Next** to display the Custom Setup form. Here, features can be added or removed.

Repair – Select this option and click **Next** to fix errors in the program installation.

Remove – Select this option to uninstall MLSuite from the computer or server.

The installer can also be run from the Control Panel, in the **Programs and Features** menu. Select **MLSuite** from the list and select **Uninstall**, **Change** or **Repair** to perform the operations described above.

Programs and Features						- 0	×
$\leftarrow \rightarrow \checkmark \uparrow \overline{0} \rightarrow Control P$	anel > Programs > Programs and Features			`	Search Pro	grams and Fea	P
Control Panel Home	Uninstall or change a program						
View installed updates	To uninstall a program coloct it from the list and then	click Uninstall, Change, or Penair					
Turn Windows features on or	to uninstan a program, select it nom the list and then	click offinistall, change, of Repair.					
off	Organize 🕶 Uninstall Change Repair						•
	Name	Publisher	Installed On	Size	Version		
	💽 Microsoft Edge	Microsoft Corporation	7/12/2023		114.0.1823.79		
	📨 Microsoft Edge WebView2 Runtime	Microsoft Corporation	7/13/2023		114.0.1823.79		
	Microsoft OneDrive	Microsoft Corporation	7/14/2023	282 MB	23.139.0704.0001		
	🗊 Microsoft Teams	Microsoft Corporation	6/27/2023	135 MB	1.6.00.16472		
	Microsoft Update Health Tools	Microsoft Corporation	5/11/2023	1.02 MB	3.72.0.0		
	🖟 Microsoft Visual C++ 2015-2022 Redistributable (x	Microsoft Corporation	7/14/2023	20.4 MB	14.34.31931.0		
	Hicrosoft Visual C++ 2015-2022 Redistributable (x	Microsoft Corporation	7/14/2023	17.9 MB	14.34.31931.0		
	🗹 Ҝ Multilogger Suite 2023.0.0	Canary Systems, Inc.	7/14/2023	1.59 GB	23.0.0.36		
	🗾 Notepad++ (64-bit x64)	Notepad++ Team	6/10/2023	14.4 MB	8.5.3		
	📧 Npgsql 3.2.6	EnterpriseDB	7/14/2023	4.81 MB	3.2.6-3		
	NVIDIA Graphics Driver 528.79	NVIDIA Corporation	5/30/2023		528.79		
	PostGIS Bundle 3.3.3 for PostgreSQL x64 13 (remo		7/14/2023				
	PostgreSQL 13	PostgreSQL Global Developmen	7/14/2023	1.00 GB	13		
	🚟 Realtek USB Ethernet Controller All-In-One Windo	Realtek	3/27/2023	6.68 MB	10.54.608.2022		
	Opiceworks Agent	Spiceworks, Inc.	3/27/2023	3.62 MB	10.0.6.0		
	Teams Machine-Wide Installer	Microsoft Corporation	3/30/2023	131 MB	1.5.0.30767		
	UXP WebView Support	Adobe Inc.	4/13/2023	326 MB	1.1.0		
	Canary Systems, Inc. Product version: 23.0.0.36 Help link: http://canarysystem	Support link: http://w Update information: http://ca Size: 1.59 GB	ww.canarysyste anarysystems.co	<u>ems.com</u> om/support/sof	tware-downloads/		

2.5.2 MLSuite Utilities

The MLSuite installer includes three Utilities that are installed by default.

🖟 Multilogger Suite	2023.0.0 Setup			_		×
Custom Setup Select the way you	u want features to be insta	lled.	((CAN	VAR	RY
Click the icons in t	ne tree below to change th	e way	features wil	l be installed.		
	 ✓ MLReport ✓ MLServer ✓ MLGateway ✓ MLWeb 	^	Client side	utilities		
	Utilities Utili	~	This featur hard drive subfeature subfeature hard drive	re requires 0K . It has 0 of 3 es selected. Ti es require 0KB	B on your he on your	
Reset	Disk Usage		Back	Next	Cano	el



MLPerfindex – A tool to aid in optimizing server performance, see *Appendix E – Performance Index Tool* for more information.

IBOConsole - Firebird database management console.

Icons – Installs a library of icons that can be used for data visualization in MLWeb, see *Appendix B.2* – *Installing the MLWeb Icon Library Locally* for more information.

2.6 Creating Firebird Temp Folder

Firebird databases create temporary files when running **Backup** and **Restore** tasks. By default, these files are written to the Windows Temp folder. These files are typically three times the size of the Firebird's .gdb file.

Note

Canary Systems recommends creating a folder other than Windows Temp to store Temp files. Once created, the path for this folder must be entered into the conf file (see steps below).



Hint

Modify permissions are required to edit this file. Refer to section 2.7 Granting User Permissions.

- 1. Create a new folder where the Firebird temp files can be written: "FB_Temp"
- 2. Locate the **firebird.conf** file (Program Files > MultiLogger > Firebird > firebird.conf)
 - a) Open file with notepad and find "TempDirectories"

```
# ------
# Temporary directories
#
# Provide ';'-separated trees list, where temporary files are stored.
# Relative paths are treated relative to RootDirectory entry
# (see above). Default value is determined using FIREBIRD_TMP,
# TEMP or TMP environment options. Once the first specified
# directory has no available space, the engine will switch to the
# next one, and so on.
# E.g.:
# TempDirectories = c:\temp
# or
# TempDirectories = c:\temp;d:\temp
#
# Type: string (special format)
#
# TempDirectories =
```



b) Remove the "#" to uncomment out the TempDirectories and include the path of the new folder: "TempDirectories = C:\Windows\Temp\FB_Temp"



3. Save the firebird.conf file

Note
When performing an upgrade, the .conf file will not be updated once it has been edited.

- 4. Restart the Firebird server
 - a) Open Services
 - b) Navigate to Firebird Server DefaultInstance and right click
 - c) Restart

🔍 Services							-	\times
File Action View	Help							
⇐ ➡ 📰 🖸	à 🗟 🛛 🖬 🕨 🔲 🖬 🕨							
Services (Local)	Services (Local)							
	Firebird Server - DefaultInstance	Name	Description		Status	Startup Type	Log On As	^
	<u>Stop</u> the service <u>Restart</u> the service	Encrypting File System (EFS) Enterprise App Management Service Extensible Authentication Protocol	Provides the core file Enables enterprise ap The Extensible Auther	encryption techn plication manage ntication Protocol	I	Manual (Trig Manual Manual	Local System Local System Local System	
	Description: Firebird Database Server - www.firebirdsql.org	Firebird Server - DefaultInstance Function Discovery Provider Host Function Discovery Resource Public Geolocation Service Google Update Service (gupdate) Google Update Service (gupdate) Google Update Service (gupdate) Group Policy Client Human Interface Device Service Hy Host Service Hy Host Service	Start Stop Pause Resume Restart All Tasks Refresh Properties	er - www.firebird hosts the Functi er and resources he current locati tware up to date ble for applying is the use of hot or the Hyper-V h to exchange da	Running Running Running	Automatic Manual Manual Manual Automatic (D Manual Automatic (T Manual (Trig Manual (Trig	Local System Local Service Local Service Local System Local System Local System Local System Local System Local System Local System Local System	
	Extended Standard		Help					~
Stop and Start service F	irebird Server - DefaultInstance on Loca	I Computer	•					

2.7 Granting User Permissions

Any user accounts that will be used to log onto the server, to access MLServer or MultiLogger, require permission to specific folders to be granted. The accounts need "Modify" access to the following locations:

- The CanarySys folder (and all subfolders) by default this is under C:\Users\Public\Documents\CanarySys but is often moved to the root of one of the data drives on the server.
- The Temp folder (and all subfolders) by default this is located in C:\Windows\Temp, but that can be moved by changing the system environment variables.

canarysystems.com





Other customized files and folders may require similar permissions. For questions on specific setups, Contact Canary Systems Support.

2.8 Binding SSL Certificate

It is highly recommended that databases hosted on the web have an SSL certificate. SSL certificates authenticate a website's identity and enable an encrypted connection. This security protocol ensures that when users interface with the database, the data therein is protected.

Check with your organization's IT department to see if an SSL certificate already exists for your website. New SSL certificates can also be purchased from various vendors on the web.

The process for binding the certificate to an IP and port is found below. For this part of the setup, you will need the certificate's fingerprint or "hash," the target machine's IP address, and the port to be used if different from the default.

1. Run the following from elevated PowerShell:

netsh http add sslcert ipport="<IP>:<PORT>" certhash="<CERTHASH>" appid=("{"+[guid]::NewGuid()+"}")

Replace **<IP>** with the IP address of NIC web portal will be hosted through. Use 0.0.0.0 to designate any/all.

Replace **PORT>** with the port number that the web portal is accessible at via above IP address.

HTTPS is 443.

Replace **<CERTHASH>** with the SSL certificate hash/thumbprint.

If the command ran correctly, the following line in PowerShell displays, "SSL Certificate successfully added."

- 2. Restart the MLWeb service associated with the SSL certificate.
- 3. Run the following command to view/confirm SSL certificate binding:

netsh http show sslcert



S C:\Windows\system32> netsh http	p add sslcert ipport="0.0.0.0:443" certhash="bea301efe54899544337844440b1c29a8e2031e4" appid=(
SL Certificate successfully added	
S C:\Windows\system32> netsh http	p show ssicert
SL Certificate bindings:	
TP: nort	- 6 6 6 6-443
Certificate Hash	bea301efe54899544337844448b1c29a8e2031e4
Application TD	(a5abfff8-Ra66-47f1-a75c-Re636bc7aa88)
Certificate Store Name	: (null)
Verify Client Certificate Revo	cration : Enabled
Verify Revocation Using Cache	d Client Certificate Only : Disabled
Usage Check	: Enabled
Revocation Freshness Time	. 0
URL Retrieval Timeout	1 0
Ctl Identifier	: (null)
Ctl Store Name	: (null)
DS Mapper Usage	Disabled
Negotiate Client Certificate	: Disabled
Reject Connections	: Disabled
Disable HTTP2	: Not Set
Disable QUIC	: Not Set
Disable TL51.2	: Not Set
Disable TLS1.3	: Not Set
Disable OCSP Stapling	: Not Set
Enable Token Binding	i Not Set
Log Extended Events	: Not Set
Disable Legacy TLS Versions	: Not Set
Enable Session Ticket	: Not Set
Extended Properties:	
PropertyId	: 0
Receive Window	: 1048576
Extended Properties:	
PropertyId	: 1
Max Settings Per Frame	: 2796202
Max Settings Per Minute	: 4294967295
Extended Properties:	
Propertyld	: 2
Extended Properties:	
propertyId	
Extended Properties:	
Propertyld	

Redirecting Http to Https

To setup autoredirect from http to https, follow the below steps:

1. From the directory where MultiLogger is installed, navigate to Program Files | MultiLogger | MLWeb and then open commonSettings.json.

📙 🛃 🗖 🖛 🗸 MLWeb				-	_ ×
File Home Share	View				~ 🕑
← → · ↑ 🔤 « Pro	gram Files → Multilogger → MLWeb	V Ö 🖓	Search MLWeb		
Ouick access	Name	Date modified	Туре	Size	^
Deskton 🔮	CanarySystems.Zendesk.pdb	9/20/2023 9:21 AM	Program Debug D	34 KB	
Desktop A	Castle.Core.dll	5/6/2020 7:02 AM	Application exten	273 KB	
Downloads #	i cfitsio.dll	4/21/2023 6:24 PM	Application exten	1,347 KB	
🚆 Documents 🛛 🖈	CliWrap.dll	8/24/2022 6:15 PM	Application exten	93 KB	
📰 Pictures 🛛 🖈	clretwrc.dll	11/18/2022 11:15 AM	Application exten	303 KB	
🔒 Logs 🛛 🖈	🗟 cirgc.dll	11/18/2022 11:08 AM	Application exten	648 KB	
MLWeb	🗟 clrjit.dll	11/18/2022 11:10 AM	Application exten	1,496 KB	
T : 00	Collections.Pooled.dll	4/3/2019 12:36 AM	Application exten	86 KB	
Inis PC	CommandLine.dll	5/17/2022 4:11 AM	Application exten	220 KB	
💣 Network	o commonSettings	9/20/2023 11:49 AM	JSON Source File	1 KB	
_	🗟 concrt140.dll	4/21/2023 6:24 PM	Application exten	302 KB	
	Conditions.dll	9/19/2017 6:31 AM	Application exten	79 KB	
	🗟 corecir.dll	11/18/2022 11:18 AM	Application exten	4,985 KB	
	📧 createdump	11/18/2022 11:15 AM	Application	60 KB	
	📧 curl	4/21/2023 6:24 PM	Application	160 KB	
	🔄 curl-ca-bundle	4/21/2023 6:22 PM	Security Certificate	220 KB	
	dotnet-aspnet-codegenerator-design.dll	3/8/2023 5:30 PM	Application exten	53 KB	
	📧 drawmap	4/21/2023 6:24 PM	Application	5 KB	
	drawmapDirect	4/21/2023 6:24 PM	Application	6 KB	
	drawmapDirectPrint	4/21/2023 6:24 PM	Application	7 KB	
	drawmapGDIPIus	4/21/2023 6:24 PM	Application	6 KB	
	drawquery	4/21/2023 6:24 PM	Application	7 KB	
	EntityFramework.dll	4/16/2020 4:38 PM	Application exten	4,862 KB	~
742 items 1 item selected	75 bytes				



2. Change the AllowAutoRedirectoHttps command from "false" to "true" as shown in the figure below.



3. Restart MultiLogger MLWebService.



Note

This process performs redirecting from http to https by redirecting traffic from port 80 to port 443. The logic will not not work in cases where other ports are in use or the app is being accessed from an external network that uses different ports mapping. It works strictly with 80 and 443 port numbers.



3. Launching and Configuring Applications

Once the MLSuite installer completes, shortcuts for the installed applications and services are added to the desktop.

Applications and services can also be launched from the **MultiLogger** folder generated during installation. By default, the MultiLogger folder's file path is **\Program Files\MultiLogger**.

📙 🛃 = Multilogger					-		×
File Home Share View							~ ?
$\leftarrow \rightarrow \checkmark \uparrow$ \blacktriangleright This PC \rightarrow OS (C:)	> Program Files > Multilogger			ר ט ג Search ו	Aultilogger		
) A Quick accord	Name	Date modified	Туре	Size			^
> A Quick access	DataImportRules	1/7/2022 12:07 PM	File folder				
> 🍠 This PC	📜 Firebird	1/7/2022 12:07 PM	File folder				
> 🇳 Network	IBOConsole	1/7/2022 12:07 PM	File folder				
	MLWebHW	1/12/2022 10:50 AM	File folder				
	Postgres	9/28/2021 1:15 PM	File folder				
	Python	1/12/2022 10:50 AM	File folder				
	Services	1/7/2022 12:05 PM	File folder				
	SQLite	1/7/2022 12:07 PM	File folder				
	📕 Utils	1/7/2022 12:07 PM	File folder				
49 items						[

Additionally, shortcuts can be placed in the Startup folder so that applications will be launched when a user logs in.

A MLSuite group in the Start menu is created by the installer; this provides shortcuts to the primary applications installed.

3.1 MLGateway

MLGateway is designed to operate as a service; MLWebHardware and MultiLogger are applications used to configure the MLGateway service. MLGateway performs all the actual functions related to system management, programming, monitoring and data collection. MLGateway is installed as a Windows Service. Running as a service provides the advantage of not requiring a user to be logged in for MLGateway to function.

MLGateway performs the following functions:

- Multi-user access to dataloggers and other hardware
- MultiLogger text and graphical monitoring functions
- Automation of data collection
- Automation of database data import (through MLServer)

Open the MLGateway interface by clicking on the MLGateway icon 5, found on the desktop or in the MLSuite group in the start menu.



Note

Closing the Control Panel does not close MLGateway, as it is installed and running as a service. To find out more about managing Windows Services, see Microsoft's Windows Services documentation.



The MLGateway Control Panel is shown in the figure below. It provides status information as well as buttons to access the various forms and functions.



The Function Buttons perform the following actions:

Settings – Configures the Port used for MultiLogger to MLGateway communications.

License – Configures the MLGateway license.

Log File – Displays the log file viewer.

Help – Displays the help file.

About – Displays the current version and support contact information. This includes the **Call Stack** button that displays the call stack information for use in troubleshooting. This information can be copied or emailed directly to Canary Systems support from the dialog.

About MLGateway	×
\$	MLGateway Ver: 2023.0.0.36
Copyright © 199 <u>Fo</u>	97-2023, Canary Systems, Inc. r technical support:
Pho e-mail: su web: http:	ne: (603) 526-9800 pport@canarysystems.com ://www.canarysystems.com
🖃 Resourc	es 🔄 Call Stack
	Close

3.2 MLServer

MLServer is the application included with the MLSuite software that provides the back-end functionality for MLWeb and MLField. MLServer is installed as a Windows Service. Running as a service provides the advantage of not requiring a user to be logged in for MLServer to function. It performs the following functions:

- Importing data sent to it by MLGateway
- Importing data collected by other systems and/or software through import configurations
- Automated backup and restore functions
- Processing of data in the database, generation of alarms and other notifications
- Processing and generation of automated outputs
- Management of MultiLogger Gateway Lists



4. MLAdmin Configuration

MLSuite[®] includes a browser-based admin page for management of databases and sites. Access to the admin page, MLAdmin, can be restricted to local access only, or can be made available remotely through a network.

Note

Canary Systems recommends contacting our Support team to assist with the initial configuration of MLAdmin. See pg. 4 of this guide for contact details.

MLAdmin is accessed on the machine hosting MLWeb locally at **http://localhost/admin**, or remotely at **http://[Machine Name or IP]/admin**.

4.1 Installation Setup

MLAdmin must be configured after installation of MLSuite. Upon initial login, the setup process begins.

1. MLAdmin has a dedicated Administrator Account for its management. A username and password for this account must be created.

Be sure to save this information, as this account is needed to view and edit settings in MLAdmin. Click **Submit** when complete.

- The location of each MLSuite service must be specified. To reach the editor for this function, navigate to Configuration | Services. Enter the machine name or IP of the machine hosting each service, then click Save.
- 3. The passwords for each required account must be entered. To reach the editor for this function, navigate to **Configuration | Passwords**. Click the [▲] icon in each field to display the password. Click the [▲] icon in each field to hide the password.

The accounts are as follows:

SYSDBA – Enter the password for the Firebird sysdba user. For initial set up, **masterkey** is required, however it can be changed later through MLWeb.

POSTGRES ml_user - An internal user for accessing PostgreSQL data. Enter a password as desired.

POSTGRES postgres (admin) – The PostgreSQL super user. This internal user is used for database operations. Enter the password created during installation of PostgreSQL, as detailed in section 2.2.2 PostgreSQL and Add-on Installation.

MLUSER – An internal Firebird user.



Note

The process of setting up or changing the MLUSER password requires a cmd file to be run. From the directory where MLSuite has been installed:

- 1. Navigate to **Program Files | MultiLogger | Firebird | bin** and then select fb_users_setup.cmd.
- 2. Run the cmd.
- 3. When prompted, enter the SYSDBA password you have just set up in MLAdmin. This brings up a series of options.
- 4. Type 1 and then hit Enter to select 1. Setup ML_User_account
- 5. Enter a password as desired. Make sure to take note of this.
- 6. Press Enter; the cmd closes.

Return to MLAdmin and enter the password you have just setup into the MLUSER Password field. **The password entered here must match the password you have set up in the cmd.**

Windows process User Name - Enter the Windows user name created for the Process account.

Note

If one does not yet exist, a windows account called "Canary_Process" must be created before continuing. This can be either a Domain account or a local system account. The Canary Process account should be a user level account. See **Appendix D – Creating Canary Process Account** for steps on how this is done.

Windows process Password – Enter the Windows password configured for the Process account.

4. From the Admin Dashboard Configuration:

- a) Specify how MLAdmin is accessed.
 - i. If **Local Connections only** is checked, MLAdmin is only accessible on the server hosting MLWeb by typing http://localhost/admin into a browser.
 - ii. If unchecked, MLAdmin can be accessed remotely by typing http://[Machine Name or IP]/admin into a browser.



b) Set the number of hours which backups and other database operations remain accessible through MLAdmin; they are deleted after the set time expires.

<	
	Note
	11000

Regardless of the Local Connections only toggle setting, MLAdmin cannot be accessed remotely unless a new firewall rule has been set. See section 2.2 *Firewall Configuration.*

5. After the Admin Dashboard Configuration page has been configured, click Save.

MLAdmin can now be accessed through the Administrator account established in step 1. Continue to section *4.2 Admin Controls* for a list of controls available in MLAdmin.

4.2 MLAdmin Controls

MLAdmin consists of a menu on the left containing tabs for each functionality, and a workspace on the right that displays the selected tab's fields. Menu tabs and subtabs include:

Home – The initial landing page for MLAdmin, displaying current MLSuite Version and real time monitoring.

Dashboard Config – Allows for enabling or disabling remote access to MLAdmin.

Background Jobs – Lists operations recently run or currently running in the background, such as restorations and backups.

Sites – Lists all configured sites. Expanding this menu option provides access to individual sites. Clicking on these sites access their database operations.

Configuration – Provides configurations MLAdmin and database configurations. Expand to access additional configurations. For more detailed info on configuring email, see section *4.3 Configuring Email Sending Information in MLAdmin*.

Continue to the next section of this guide for instructions on creating a new database and Site in MLAdmin.

4.3 Configuring Email Sending Information in MLAdmin

The Email Sender Configuration configures how MLServer connects to the mail server.

- 1. Enter the SMTP Server host name, fully qualified domain name or IP Address as the SMTP Host.
- 2. Specify the Port. The default SMTP port is 25
- **3.** If user authentication is required for relay, enter the **SMTP User** and **SMTP Password**. If the connection is only restricted by IP address then the User and Password are not necessary.
- 4. The From Name and From Email will be displayed to the recipient. Generally, the email is the SMTP User name followed by the domain originating the email. In most cases it does not matter what name is entered here; however, some SPAM filtering software may reject mail which does not have a valid From Email identified.
- Select the SSL Method form the drop-down list. Select None for SMTP connections, and SSL or TLS for SMTPS connections.



- 6. Once the information is complete the email sender configuration can be tested. To test the email settings, enter an email address in the Test Email Address field, and click the **Send Test Message** button. A notification indicates if the email was sent successfully, or not. Common error messages include:
 - a) Host Not Found Check the Server entry for correct server name.
 - b) Connection Timed Out Check the Port setting or check for proper firewall configuration.
 - c) **Incorrect Authentication Data** Check the User Name and Password.

Once all the necessary information has been entered click **Save**.

4.4 Passwords Configuration

The Passwords Configuration workspace allows for viewing and updating passwords for the four required system users as well as the Process Account credentials. Click the rightarrow icon in each field to display the password. Click the **rightarrow** icon in each field to hide the password.

SYSDBA – The Firebird SYSDBA user. Default password is **masterkey**. This password can be changed here.

POSTGRES 'ml_user' – An internal user for accessing PostgreSQL data. This password can be changed here.

POSTGRES 'postgres' (admin) – The PostgreSQL super user created during installation of PostgreSQL. It is an internal account used for performing database operations. The password can **ONLY** be changed from pgAdmin, a PostgreSQL tool. See *Changing the POSTGRES admin passwords* for more details.

MLUSER – An internal Firebird user. This password must be changed from the fb_users_setup.cmd file (see note in section *4.1 Installation Setup*).

Windows process User Name – The user name for the Process Account in MLServer. This account does not require admin rights. It is used for running import scripts, notifications, scheduled outputs and other operations that leave the MLSuite software to interact with the server. If not set up and specified these operations will not work.

Windows process Password – Password for the Process Account in MLServer. When changing this password, it must be changed on the windows account and then changed here to match.

Changing the POSTGRES admin passwords

The POSTGRES admin passwords are used for internal linking of MLServer with the MLWeb and PostgreSQL applications. Mismatched passwords will lead to system failure. In order to change these passwords from their initial values, it's important to do so in the correct order.

- 1. For the POSTGRES admin password, log into pgAdmin and change the password. Please see the current pgAdmin documentation for details.
- Change the password in the MLAdmin Passwords workspace to match the new password. Do not forget to Save the changes. The system may take a minute to update its internal settings and should continue function normally afterwards.

Note

In MLWeb 2021, the Firebird admin user account doubled as the admin user account for MLWeb. In MLWeb 2023, these accounts are separate.

5. MLWeb Configuration

Once MLSuite has been installed and MLAdmin has been configured, further configuration for MLWeb is possible.

5.1 Creating New Databases and Sites

Databases and sites are created through MLAdmin. Log into MLAdmin using the credentials specified in step 1 of the installation set up completed in section *4.1 Installation Setup*.

(K Hint

MLAdmin is accessed on the machine hosting MLWeb locally at **http://localhost/admin**, or remotely at **http://[MachineName or IP]/admin**.

5.1.1 Creating a Database

- 1. Navigate to Configuration | Databases.
- 2. Click Add to add a new blank entry.
- 3. The database .gdb file and database name are initially configured in the Database Path field.
 - a) Enter the path where the Database's .gdb database file will be located.
 - b) Define the name of the database followed by .gdb. The .gdb extension is required.

If the database files are located on the drive (D:) under **Databases>Firebird**, and the database is to be titled **example**, enter **D:\Databases\Firebird\example.gdb**.

When creating and naming a new database the following character restrictions need to be considered:

- Only include alphanumeric characters as well as the underscore "_" symbol in the database name.
- All database names must start with an alphanumeric character.
- 4. For the database to be accessible and to create the associated site, it must be active. Check the **Active** checkbox and click the **Save** button for the database entry.

Hint

If the Active checkbox cannot be checked, confirm that the SYSDBA user name and password have been defined.

5. Once the new Database has been saved, **Save** the Databases Configuration workspace. The database *.gdb* file is then created in the location specified.

The database can now be licensed, and the site can be created.

See section 6.2 Database Licensing of this guide for more information on Database Licensing.



Continue to *5.1.2 Creating a Site* for instructions on creating a new site, then to *5.1.3 Site Management* for activating the Postgres database for 3D functionality.

5.1.2 Creating a Site

After a database has been created and is active, its site can be created.

- 1. Navigate to the Sites tab on the left menu, then click Add New Site from the dropdown menu.
- From the Add New Site page, enter the database into the Database field to automatically populate the Site Name field with the database name. The site name is used as part of the site's URL.
- 3. Click the **Save** button for the site entry. The site is now created.
- 4. Before the site can be accessed, the server where MLSuite is installed must be restarted.



If MLWeb is published on the internet, it is strongly recommended to enforce HTTPS protocols for it. See section *2.8 Binding SSL Certificate.*

Continue to 5.1.3 Site Management for details on creating the PostgreSQL database and patching databases when necessary.

5.1.3 Site Management

After saving the Site workspace additional site management buttons become available.

Creating Postgres Database

The first time a site is created in MLAdmin, the Postgres database must also be created. The Postgres database is required in projects using 3D data.

From the **Sites** workspace, click **Create Postgres Database**. A message will be displayed once the PostgreSQL database is created successfully.



Patch Database

Ensure that the Firebird and Postgres database versions are current. If a patch is required, the **Patch** buttons become active and should be clicked.

If the required versions of the databases already exist, the Patch Database buttons are disabled.

5.1.4 Accessing MLWeb

Once a site has been created **and the server has been rebooted**, MLWeb can be accessed by entering one of the following into the web browser:

1. [domain name]/mlweb/[site name]. For example: geomonitoring.com/mlweb/demolog.



- 2. [ip address]/mlweb/[site name]. For example: 172.25.10.75/mlweb/sitename.
- 3. [machine name]/mlweb/[site name]. For example: bobscom/mlweb/sitename.
- 4. localhost/mlweb/[site name] (if browser is running on same server as MLWeb).

Note

Canary Systems does not recommend installing MLWeb on the same server as the browser.

5.2 Working File Path

MLSuite 2018 and newer uses the Public Documents folder (typically C:\Users\Public) to store system configuration files. This path is known as the [Public Documents] or [Shared Docs] folder.

The **[Shared Docs]** path is used for all system configuration files. These include additions or modifications to the MultiLogger programming options, datalogger configuration files and collected data files, among others. Only program files and other non-customizable files are now stored in **Program File\MultiLogger** (or an alternate installation path, if it was changed).

To find the system configuration files for each application, open **My Computer** and then the **Local Disk (C:)** drive. Next, browse to **Users | Public | Public Documents | CanarySys**. Notice the subfolders in the CanarySys folder for each application installed.

📙 🛃 🚽 CanarySys					-		×
File Home Share View							~ 🕐
\leftarrow \rightarrow \checkmark \uparrow \frown \rightarrow This PC \rightarrow Local	Disk (C:) > Users > Public >	Public Documents > CanarySys		~ Č	Sear	ch Can	P
ProgramData	Name	Date modified	Туре	Size			
Users	MLDatabase	12/11/2017 10:30	File folder				
.NET v2.0	MLGateway	6/15/2018 11:56 AM	File folder				
.NET v2.0 Classic	MLReport	11/21/2017 9:23 AM	File folder				
.NET v4.5	MLServer	6/15/2018 9:48 AM	File folder				
.NET v4.5 Classic	MultiLogger	6/15/2018 9:48 AM	File folder				
Chris	Roobrik	6/30/2017 11:23 AM	File folder				
Classic NET AppRool	units.bak	6/22/2017 9:57 PM	BAK File	61	KB		
Default	🔬 units.ini	6/15/2018 9:23 AM	Configuration sett	61	KB		
Default	🔬 Version.ini	6/15/2018 9:48 AM	Configuration sett	11	KB		
Default.migrated							
Public							
Libraries							
Public Account Picture							
Public Desktop							
Public Documents							
CanarySys							
9 items							==

CanarySys Folder Location

It is recommended that the CanarySys folder be relocated to save on resource utilization as well as for ease of access.

The CanarySys folder can be permanently moved to a designated location. This is done by uninstalling MLSuite, moving the folder to the desired location and making adjustments in the Registry Editor. It is not advised to make changes to the Registry Edit without expert guidance. Contact Canary Systems for assistance permanently relocating the CanarySys folder.



5.3 Active Directory Integration

MLSuite allows both Windows and Azure Active Directory user accounts to log into a project's database in MLWeb. The following subsections describe the steps needed for integration with each of these Active Directories.

Note

Some additional configuration settings for the database hosting server are required during installation. Consult your IT department for assistance before beginning the process.

5.3.1 Windows Active Directory

Configuring Active Directory

Note
Active Directory must be installed prior to configuring Active Directory integration with MLSuite.

Begin by configuring Active Directory on the Active Directory server.

1. Open the Active Directory Users and Computers application from the Start menu and browse to the Computers group under the local domain.

Active Directory Users and Complexity	puters			_	\times
File Action View Help					
🗢 🄿 🙍 📰 📋 🔯 💀	🛓 🛛 🖬 🛛 🐔	📚 🛅 🍸 🖻	(B)		
 Active Directory Users and Com Saved Queries EanarySystems.com Builtin Computers Domain Controllers ForeignSecurityPrincipal: Managed Service Accour Users 	Name	Type Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer Computer	Description		
< >					



2. Double-click on the server where MLWeb is installed (HOST-SERVER in this example) to bring up its Properties dialog box, as seen in the figure below.

		HOST-SE	RVER Prop	erties	?	×
General	Operating Sy	stem Member Of	Delegation	Location	Managed By	Dial-in
Delega behalf (tion is a securit of another user	y-sensitive operatio	on, which allow	vs services	to act on	
⊖ Do	not trust this co	mputer for delegati	on		_	
True	st this compute	r for delegation to a	any service (Ke	erberos only)	
	st this compute	r for delegation to s	pecified service	ces only		
0	Use Kerberos	only				
0	Use any authe	ntication protocol				
Se	rvices to which	this account can p	present delega	ited creden	tials:	
s	ervice Type	User or Computer	Port	\$	Service Na	
	Expanded		Add	Re	move	
		ОК	Cancel	A	oply	Help

3. From the Delegation tab, select the option **Trust this computer for delegation to any service** (Kerberos only), then click OK.



Configuring MLServer

- 1. On the database hosting server, open **Services** (available from **Start** | **Windows Administrative Controls**) and right-click on the MLServer entry.
- 2. From the Log On tab, ensure that MLServer is logged in via the Local System account, as seen in the figure below.

Multilogger: MLServer Properties (Local Computer)	×
General Log On Recovery Dependencies	
Log on as:	
Local System account Allow service to interact with desktop	
This account:	Browse
Password:	
Confirm password:	
OK Cancel	Apply



5.3.2 Azure Active Directory

Before you begin, log into the online Azure portal.

Configuring Active Directory

- **1.** Add MLSuite to the Azure portal as an Enterprise application.
 - a) Go to the Enterprise Applications menu and select New application.

Home > Enterprise applications - All app	lications
Enterprise applications - Canary Systems, Inc Azure Active Directory	All applications
«	+ New application == Columns
Overview	
0 Overview	Application Type Applications status Application visibility Enterprise Applications Image: Any with the status Image: Any with the status

b) From the Add an application window, select Non-gallery application.

Add an application		\$ 🗆 ×
Add your own app		Î
Application you're developing Register an app you're working on to integrate it with Azure AD	On-premises application Configure Azure AD Application Proxy to enable secure remote access.	Non-gallery application Integrate any other application that you don't find in the gallery

c) On the right side of the portal, enter application **Name** (MLSuite) and click **Add**:

* Name 👩		
MLSuite		~
Once you decide on a n application, click the "An we'll walk you through s configuration steps to g working.	ame for your new dd" button below come simple et the applicatior	/ and
Supports: 0 SAML-based single si Learn more	gn-on	
Automatic User Provi Learn more	sioning with SCI	М
Password-based sing	le sign-on	



d) Select **Single sign-on** from the left navigation, then select **SAML**:

Home > Enterprise applications - All app	lications > Categories > Add an application > MLSuite - Sin	gle sign-on	
MLSuite - Single sign-on Enterprise Application			
« Overview	Select a single sign-on method	elp me decide	
ピ Getting started 顔 Deployment Plan Manage	Disabled User must manually enter their username and password.	SAML Rich and secure authentication to applications using the SAML (Security Accession Markon Language) particular	Password-based Password storage and replay using a web browser extension or mobile app.
Properties Conners Co		Asservon merkup bergueger protocol.	
Single sign-on Provisioning Application proxy Self-service	Linked Link to an application in the Azure Active Directory Access Panel and/or Office 365 application launcher.		
Security			

e) Fill in the fields highlighted in the figure below with the details outlined in the table (Identifier SHOULD end with "/" when entered)

~	주 Upload metadata file 🛛 🦻 Change sir	ngle sign-on mode	••• Mo
Sverview			
f Getting started	Set up Single Sign-On with S	AMI	
Deployment Plan	set up single sign on wars,		
	Read the configuration guide I for help i	integrating MLSuite.	
Manage	1 Basic SAML Configuration		1
Properties			ŕ.
🗳 Owners	Reply URL (Assertion Consumer	https://canarysystems.com/misuite https://www.mlwebtest.com/Saml2/Acs	
-A Users and groups	Service URL)		
gr Users and groups	Sign on URL	Optional	
Single sign-on	Relay State	Optional	
	Logout Url	Optional	

Identifier (Entity ID)	https://canarysystems.com/mlsuite/
Reply URL	https:// <your domain="" mlweb2023="">/mlweb/<your database<="" th=""></your></your>
(Assertion Consumer Service URL)	name>

A Metadata URL is generated. Copy and save the URL as it is needed later in the configuration process.

Status	Active
Thumbprint	
Expiration	7/30/2022, 6:58:10 AM
Notification Email	user@canarysystems.com
App Federation Metadata Url	https://login.microsoftonline.com/1acfdba4-7cd0-4
Certificate (Base64)	Download
Certificate (Raw)	Download
Federation Metadata XML	Download



- 2. Authenticate platform
 - a) Go to the Authentification section of your enterprise application
 - b) Click Add platform
 - c) Select Single-page application
 - d) In the Redirect URIs section, fill in your redirect URI (https://<your mlweb2023 domain>/mlweb/<your database name>) and then click Configure

Single-page application Redirect URIs	Quickstart	Docs 🗗	Ŵ
The URIs we will accept as destinations when returning authentication responses (tokens) after successfully authenticating URI you send in the request to the login server should match one listed here. Also referred to as reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to as reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to as reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to as reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restrictions and the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restrictions are the request to the login server should match one listed here. Also referred to a reply URLs. Learn more a restriction are the restrictio	or signing out user bout Redirect URIs a	rs. The redir and their	rect
http://localhost:5001/mlweb/demolog			Û
Add URI Grant types			
Your Redirect URI is eligible for the Authorization Code Flow with PKCE.			

- 3. Configure MLSuite application:
 - a) Go to App registrations and open the newly created application.

Home > App registrations				
App registrations				\$ ×
🕂 New registration 🛛 🕀 Endpoints 🗙 Trout	oleshooting 🛛 💙 Got feedback?			
All applications Owned applications				
, Start typing a name or Application ID to filter these	e results			
DISPLAY NAME	APPLICATION (CLIENT) ID	CREATED ON	CERTIFICATES	& SECRETS
ML MLSuite	and the second se	7/30/2019	-	



b) Select **Certificates & secrets** from the left-navigation and click **New client secret**:

Home > App registrations > MLSuite - 0	Certificates & secrets
MLSuite - Certificates & :	secrets x
	Credentials enable applications to identify themselves to the authentication service when receiving
K Overview	tokens at a web addressable location (using an HTTPS scheme). For a higher level of assurance, we recommend using a certificate (instead of a client secret) as a credential.
🗳 Quickstart	Certificates
Manage	Certificates can be used as secrets to prove the application's identity when requesting a token.
Branding	Also can be referred to as public keys.
Authentication	
💡 Certificates & secrets	No certificates have been added for this application.
API permissions	
Expose an API	THUMBPRINT START DATE EXPIRES
🔥 Owners	
Roles and administrators (Previ	Client secrets
0 Manifest	A secret string that the application uses to prove its identity when requesting a token. Also can be referred to as application password.
Support + Troubleshooting	+ New client secret
X Troubleshooting	DESCRIPTION EXPIRES VALUE
New support request	
	No client secrets have been created for this application.

c) Give the secret a **Description** and click **Add**.

Add a client secret		
Description MLSute Secret		
Expires In 1 year In 2 years Never		
Add Cancel]	

Note

Make sure to copy and save the created secret as it is required for configuring MLWeb as described in the following section.

Client secrets			
A secret string that the application uses to	o prove its identity when requesting a token	Also can be referred to as application password.	
+ New client secret			
DESCRIPTION	EXPIRES	VALUE	
Suite Secret	12/31/2299	6	۵



4. Add Permissions

a) Select API Permissions from the left-navigation and click Add a permission.



b) From the Microsoft APIs tab click Microsoft Graph

c) Click Application permissions

Request API permissions	X
 < All APIs Microsoft Graph https://graph.microsoft.com/ Docs What type of permissions does your application require? 	
Delegated permissions Your application needs to access the API as the signed-in user.	Application permissions Your application runs as a background service or daemon without a signed-in user.

Note

In MLWeb 2023, both Application and Delegated permissions are required for Azure Active Directory setup. At the end of the steps given here for setting up Application permissions, you will be redirected back to this step to start the process over for Delegated permissions. The process for both is the same.



d) Scroll down permissions tree to locate and expand **User** category, check **User.Read.All**, and click **Add permission**

	User.Export.All	
	Export user's data 👩	Yes
	User.Invite.All	Yes
\checkmark	Read all users' full profiles 🕦	Yes
	User.ReadWrite.All Read and write all users' full profiles 👩	Yes

e) Return to API permissions area and click Grant admin consent for <Your Company name>:

	Permissions have changed. Users and/or admins will have to consent even if they have already done so previously.
 Øverview Quickstart Manage 	API permissions Applications are authorized to use APIs by requesting permissions. These permissions show up during the consent process where users are given the opportunity to grant/deny access.
with a standing stand	+ Add a permission
Authentication	API / PERMISSIONS N TYPE DESCRIPTION ADMIN CONSENT REQUIRED
📍 Certificates & secrets	▼ Microsoft Graph (1
API permissions	User.Read.All Application Read all users' full pr Yes 🛕 Not granted for Can
Expose an API	These are the permissions that this application requests statically. You may also request user
Owners	consent-able permissions dynamically through code. See best practices for requesting permissions
Roles and administrators (Previ	
Manifest	Grant consent
Support + Troubleshooting	As an administrator, you can grant consent on behalf of all users in this directory. Granting admin consent for all users means that end users will not be shown a consent screen when using the
★ Troubleshooting	application.
New support request	Grant admin consent for Canary Systems, Inc.

- f) Return to step c) and go through the steps again for Delegated permissions.
- g) Ensure the desired permissions have been granted.

✓ Microsoft Graph (2) User.Read.All Delegated Read all users' full profiles Yes ⊘ Granted for Canary Syst	API / Permissions name
User.Read.All Delegated Read all users' full profiles Yes 🔮 Granted for Canary Syst,	∽Microsoft Graph (2)
	User.Read.All
User.Read.All Application Read all users' full profiles Yes 🥑 Granted for Canary Syst,	User.Read.All



5. Due to Azure security rules, users must be authorized through the Azure portal to be able to log into MLWeb using their Azure credentials. This is done by navigating to the **Enterprise** applications area and

Home > MLSuite - Users and groups					
MLSuite - Users and gro	ups				
«	🕂 Add user 💉 Edit 💼 F	Remove 🎾 Update Credentials 📑 Columns			
Overview	The application will appear on the Access Panel for assigned users. Set 'visible to users?' to no in properties to prevent this. →				
💅 Getting started					
Deployment Plan	First 100 shown, to search all use	rs & groups, enter a display name.			
	DISPLAY NAME	OBJECT TYPE	ROLE ASSIGNED		
Manage					
Properties	AK Alex	User	Default Access		
🗳 Owners	DN Doug	User	User		
x ^R Users and groups					
Single sign-on					
Provisioning					
Application proxy					

selecting Users and groups and Add users.

MLWeb Configuration

- 1. Go to MLWeb folder and open MLSuite.config.json file. (C:\inetpub\MLWeb)
- 2. Create the samlOptions entry:

```
"samlOptions": {
    "domainPrefix": "azure",
    "metadataLocation": "<metadata location>"
}
```

- a) The domainPrefix parameter should be "azure"
- b) Use the Azure SAML metadata location URL saved from SAML Configuration, as described in the previous subsection, for the **metadataLocation**.

Note

The metadata already contains the security certificate; you do not need to copy/install it manually.

3. Create the **azureActiveDirectory** entry using the details outlined in this step:

```
"azureActiveDirectory": {
    "credentials": {
        "graphBaseUrl": "https://graph.microsoft.com/v1.0",
        "loginBaseUrl": "https://login.microsoftonline.com",
        "tenantId": "<tenant id>",
        "clientId": "<client id>",
        "clientId": "<client secret>"
     }
   }
}
```

graphBaseUrl	Base URL for Graph API	
loginBaseUrl	Base URL for API login	
tenantid	Azure tenant Identifier	
clientId	Application Identifier	
clientSecret	Application secret	

a) To get **tenantId** and **clientId**, return to the Azure Enterprise Application, go to **App registrations** and select the previously created application.

Home > App registrations App registrations			st.	×
+ New registration 🕀 Endpoi	ints 🗙 Troubleshooting 📔 💙 Got feedback?			
All applications Owned app	lications			
	n ID to filter these results			
DISPLAY NAME	APPLICATION (CLIENT) ID	CREATED ON	CERTIFICATES & SECRETS	
ML MLSuite		7/30/2019		

b) Select **Overview**:

,O Search (Ctrl+/)	Celete Delete Delete
Overview	Display name : MLSuite
Quickstart	Application (client) ID :
lanage	Directory (benant) ID :
Branding	Object ID :
Authentication	
Certificates & secrets	
API permissions	
Note	

With the above steps completed, users should now see a **Log in with Azure User** option on the MLWeb 2023 login screen. For information on Adding Active directory users in MLWeb, see the *MLWeb User's Guide 2023*.



6. Licensing

MLSuite uses two separate forms of licensing: Gateway Licensing and Database Licensing.

- Gateway Licensing allows MLGateway to communicate with data loggers and collect and import their data.
- Database Licensing activates the automation processes for the database, such as imports, alarms, notifications, and calculations.

The processes for Gateway and Database Licensing are detailed in the following sections.

6.1 Gateway Licensing

MLGateway must be licensed and activated on each machine where MLGateway is running. This can be done either through MLWebHardware or through MLGateway.

6.1.1 Licensing MLGateway through MLWebHardware

MLWebHardware is accessed on the machine hosting MLServer locally at http://localhost/mlwebhw. It is accessed remotely at http://[Machine Name or IP]/mlwebhw.

Log in to MLWebHardware using the admin user and navigate to the License form located under Server on the left side menu.



For more information on accessing and navigating MLWebHardware, refer to the *MLWebHardware User's Guide* (canarysystems.com/support/users-guides).



Entering the License Key

From the License form in MLWebHardware, click Add to populate the license Registration form.

(CANA	RY M Systems 20	LWebHardware (i Q admin)21.0.0.76
	Æ	HOME SERVER LICENSE
😤 НОМЕ		
Server	~	🕒 Add 🕺 Delete 📝 Edit
Settings		
Information		NO ICENSES
License		
SUPPORT	>	
MLDAQ	>	
MCLOG	>	
MLTDR	>	
MLBase	>	
MLSAA	>	

Enter the Registration information and the **License Key** that was supplied with the MLSuite documentation into the License Form.

Once a valid license key and all required fields have been filled in, click **Activate** to obtain the Activation Code and activate the license.



	CANARY MLWebHardware 2021.0.0.76			i Q admin
=	HOME SERVER LICENSE ADD LICEN	ISE		
â	💉 Activate			
U		(
U	Activation	Registration		
	Machine ID	First Name*	Postal Code*	
	License Key*	Last Name*	Country*	Select item 🗸
	Activation Code	Company*	Phone	
	Get activation code	Address 1	Email*	
	indin Erdense Server	Address 2	Include in email list	
		City*	Include in future mailings	
		State*		



If a mandatory field is missing information, the field will be outlined in red to indicate missing information.

First Name*	A

Activation Response in MLWebHardware

Upon successful activation, MLWebHardware returns to the License form where the active license and Activation Code can be viewed.

(CANA)	RY MLL SYSTEMS 202	WebHardware 21.0.0.76			i Q admin
	.∈	HOME SERVER LICENSE			
✿ HOME Server Settings	~		🖊 Edit		
Information		Active License Key	Туре	Activation Code	
License			G25	0.05080	•
SUPPORT	>				
MLDAQ	>				
MCLOG	>				
MLTDR	>				
MLBase	>				
MLSAA	>				Ψ

If an invalid key is entered, or the license is unable to activate for any other reason, a message with an option to show details appears in the bottom right corner of MLWebHardware.

Clicking **Show Details** displays additional information pertaining to the error. If the error is believed to be a bug, a **Bug report** can be submitted directly through MLWebHardware by clicking the **Bug report** option.



6.1.2 Licensing MLGateway through MLGateway

To activate the Gateway license through MLGateway, launch MLGateway and then click the **License** button to open the **Configure Licensing form**.

🤟 MultiLo		×		
Settings	License	Log file	C Help	About


Entering the License Key

From the **Configure Licensing** form, click to add a new record. This opens the **License Activation form**, as shown in the figure below.

alid	License Key	Authorization Code	Туре	
\$	0000 0000 0000 0000	7123 5619 89A8 E9C0 ···		50
		License count:		50
4		License count:		50

At startup, the **License Key** is blank. Enter the key supplied with the MLSuite documentation. This is usually found on the Final QA Report form supplied by Canary Systems.

Demo Key butto	n to obtain a 30-o	lay demo key.	
ise Activation			×
License Key:	L	Demo Key	
r			
Machine ID:	2E64 26EA		
	Demo Key butto ise Activation License Key: Machine ID:	Demo Key button to obtain a 30-c ise Activation License Key:	Demo Key button to obtain a 30-day demo key. Ise Activation License Key: Machine ID: 2E64 26EA

Obtaining the Authorization Code (Activation)

After entering the License Key, MLGateway must be activated.

Click the Activate button on the License Activation panel to begin the activation process.



If registration information has not been entered on this computer, the **Product Registration** form must be completed.

Product Registration Fon	m
Please complete	the Product Registration Form
(Field	as in bold are required fields)
Version:	2021.1.0.0
License Key:	0000 0000 0000 0000
Machine ID:	2E64 26EA
Vendor:	DEMO
First Name:	Thom
Last Name:	Jones
Company:	Canary Systems
Country:	USA ~
Address 1:	
Address 2:	
City:	New London
State:	New Hampshire NH V
Postal Code:	03257
Phone:	
Fax:	
Email:	info@canarysystems.com
	Include me on the Canary Systems mailing list!
	Include me on the Canary Systems email list!

The **First Name**, **Last Name**, **Company**, **Country**, **City**, **State**, **Postal Code** and **Email** fields are required, and filling in the remaining fields is recommended.

Once the form is complete, click **Activate** (the button shows **Update** if registration information has been previously entered) to attempt connecting to the Canary Systems Authorization Code Server to obtain your Authorization Code.

Note
Internet connectivity is required for the automated Authorization Code delivery to function. If you are unable to use the electronic system, call Canary Systems Software Support at 1-603-526-9800 ext. 2 to authorize the software over the phone

If all fields are entered correctly, the License Key is valid, and the computer has Internet connectivity, the Authorization Code is uploaded into the appropriate form field and the software is activated.



Activation Response in MLServer

The following messages may display during the activation process:

Authorization Granted – Thank you for registering.

You have succeeded in activating the software.

• A required field is blank.

One of the required fields is not filled in. The fields in bold are required fields. Click OK to return to the Product Registration form, complete the form and click Activate again.

• The License Key is not valid.

The format is incorrect, or the number is not valid. Verify that the License Key is entered correctly.

• Unable to reach the Canary Systems Authorization Server.

This is usually due to lack of Internet connectivity on the computer attempting to activate the software. This may be due to Firewall configuration or network security configuration. If applicable, contact your systems administrator for assistance in resolving the issue.

If you are unable to resolve the connectivity issues, the product must be registered offline. First, you will need to restart the software, then click **Register** and **Print** on the Product Registration form after it is completed. Email this form to Canary Systems.

You will receive an Authorization Code that must be manually entered into the Software Activation form to activate the software. You may also call or email Canary Systems to obtain your Authorization Code.

• Software Authorization inactive.

This may be the result of incorrect configuration of the authorization server. Double-check the License Key entry. If it fails again, contact your vendor or Canary Systems directly.

Demo Authorization Denied – Too many requests.

MLGateway can be activated with a demo Authorization Code, which lasts 30 days. This period can be extended, but by default it expires after a single period. Contact Canary Systems if you require a longer trial period.

• Authorization Failed.

There was an error in the negotiation for the Authorization Code. Try clicking **Activate** again and if it fails again, contact Canary Systems for further direction.

6.2 Database Licensing

Database Licensing is based on the following items being present (saved) in the database:

- Number of Class Instruments
- Number of unclassed Instruments (certain instruments count as more than 1 license)
- Number of standalone Data Elements (not associated with an instrument)
- Number of 3D Data Sources

If the total number of items exceeds the number of available licenses, an additional Database License Key must be purchased. The active/inactive status of instruments or elements is not considered when determining the number of required licenses. Contact Canary Systems for more information on purchasing license keys.

Database Licensing is accessed and managed through the Databases workspace in MLAdmin.

From here a list of currently configured databases, including the number of used licenses verses the number available licenses is visible.



Licenses are configured through the Licenses workspace.

To add or view licenses, open the **Database Licenses** workspace by clicking the **License** button while in the Databases workspace.

6.2.1 Adding Licenses

The Licenses workspace lists all active licenses for the database. It allows for adding new licenses and editing and deleting existing licenses.

Click + Add button to add a new license or Edit License button to edit an existing one. This opens the License Activation form.

Fill in all required fields. The Machine ID field is read-only and is populated automatically. With the License Key entered, the Activation Code populates automatically. License Keys are obtained from Canary Systems directly.

6.2.2 Online activation

If the server is connected to the Internet, enabling the option **Get activation code from License Server** allows for obtaining a valid Activation Code from the Canary Systems licensing server automatically. In this case, clicking **Save** should activate the license and display a message indicating a successful activation.

6.2.3 Offline activation

If no Internet connection is available—or firewall rules or other issues prevent successful communication with the activation server—an Authorization Code will need to be requested. Contact Canary Systems to request an Authorization Code to activate the license. Please have your **Database License Pack Key**, **Machine ID** and **Database Alias** ready. After obtaining the code, uncheck the **Get activation code from License Server** option. This will enable the Activation Code field and allow you fill in the code you have obtained from Canary Systems. If it is correct, clicking **Save** should activate the license and display a message indicating a successful activation.

When successful, the Licensing Activation page updates with the License Key, Authorization Code and license type (showing the number of activated licenses). The **Used/Licensed** field of the Databases Configuration of MLAdmin will update as well. Click **Back** to return to the previous screen.

6.2.4 Deleting Licenses

Click the **Delete** button to delete a license record. **PROCEED WITH CAUTION.** Deleting a license record on a server that is not connected to the Internet, or whose settings may prevent it from communication with the Canary Systems licensing server, may disable the license key.

If the server is online, deleting the license will automatically update the license records in the Canary Systems activation database, and free up the license key to be used again later (on the same or a different server and database). If the server is not able to communicate with the activation database via Internet, you will have to contact Canary Systems Support and request revoking the license activation.



7. Uninstalling MLSuite

7.1 MLGateway License Deactivation

Before removing MLSuite, the Gateway License for MLGateway must be deactivated on the current machine to allow it to be reactivated on another. This can be done through MLWebHardware or MLGateway, follow the steps outlined in this section.

Once the license for MLGateway is deactivated, the licensed databases in MLAdmin must also be deactivated. This is described in section 7.2 Database Licenses Deactivation.

7.1.1 License Deactivation through MLWebHardware

Open **MLGateway** and click the **License** tab. This brings up a list of configured licenses, as shown in the figure below. Select the license you wish to delete and click the **Delete** button to deactivate the license.

(CANA	SYSTEMS 20	LWebHardware 021.0.0.76			i Q admin
	.∈	HOME SERVER LICENSE			
HOME Server Settings	¥	Object: Ob	🖊 Edit		
Information		Active License Key	Туре	Activation Code	
License			G25		*
SUPPORT	>				
MLDAQ					
MCLOG					
MLTDR					
MLBase					~
MLSAA					

7.1.2 License Deactivation through MLGateway

Open **MLGateway** and click the **License** button. This will bring up the **Configure Licensing form**, as shown in the figure below. Highlight the license and click the Delete Record button to deactivate the license.

alia	License Key		Authorization Code		Туре	
\$	0000 0000 0000 0000		7123 5619 89A8 E9C0	•••		50
			License of	ount:		50
61	× m t	<	License of	ount:		50



7.2 Database License Deactivation

In addition to deactivating the Gateway License, all database license keys should also be removed. This will allow them to be preserved and reused later.

Open **MLAdmin** and naviagate to **Configuration | Databases.** Select a licensed database and then navigate to the Licenses workspace. Make note of the License Key for future use, then click **Delete**.

Repeat for all database license keys.

7.3 MLSuite Removal



7.3.1 Uninstalling Using the Control Panel

To remove MLSuite, open the **Programs and Features** menu of the Control Panel. Locate **MLSuite** in the list of programs and click **Uninstall** to begin the removal process.

0	Programs and Features					- 0	Х	
<	\leftrightarrow \rightarrow \checkmark \bigstar Control Panel \Rightarrow Programs \Rightarrow Programs and Features							
	Control Panel Home	Uninstall or change a program						
	View installed updates To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.							
•	Turn Windows features on or							
	off	Organize 🕶 Uninstall Change Repair					?	
	Install a program from the network	Name	Publisher	Installed On	Size	Version	^	
		📓 Notepad++ (64-bit x64)	Notepad++ Team	3/26/2020	9.40 MB	7.8.5		
		Ҝ Multilogger Suite 2019.0.0	Canary Systems, Inc.	3/20/2020	1.74 GB	19.0.0.479		
		💿 Google Chrome	Google LLC	3/19/2020	400 MB	80.0.3987.149		
		😸 Microsoft ASP.NET Core 2.2.7 - Shared Framework	Microsoft Corporation	3/13/2020	103 MB	2.2.7.0		
		😹 Microsoft .NET Core Runtime - 2.2.7 (x64)	Microsoft Corporation	3/13/2020	89.4 MB	2.2.7.28009		
		Hicrosoft .NET Core 2.2.7 - Windows Server Hosting	Microsoft Corporation	3/13/2020	286 MB	2.2.7.0	~	
		anarysystems.com systems.com/support/s	soft					

A message box is displayed, asking to confirm removal of MLSuite. Click Yes to continue to uninstall.

canarysystems.com





Note

While removal of MLSuite does not delete any user created or modified files, including Network Configuration, datalogger configuration files, collected data files or user customized programming options, it is recommended to backup files before attempting removal. Prior to backing up the CanarySys folder, both MultiLogger and Firebird services should be stopped.

7.3.2 Uninstalling Using the MLSuite Installer

An alternative way to uninstall the software is to run the installation program again. This displays the Program Maintenance form, as shown in the figure below.

Select Remove, then Next to continue.

🛃 Multilogger Suite 2023.0.0 Setup	-		×
Change, repair, or remove installation Select the operation you wish to perform.	CA	NA	RY.
Change Lets you change the way features are installed.			
Repair Repairs errors in the most recent installation by fixing files, shortcuts, and registry entries.	missing and	d corrupt	
Remove Removes Multilogger Suite 2023.0.0 from your comput	ter.		
Back	Next	Can	cel

The next dialog box includes a message asking to confirm the removal of MLSuite. Click Remove to continue.

🖟 Multilogger Suite 2023.0.0 Setup	-		×
	11		
Ready to remove Multilogger Suite 2023.0.0	((CAI	VAF	3 Y
	11	SYS	TEMS
Click Remove to remove Multilogger Suite 2023.0.0 from review or change any of your installation settings, Click C	your computer. Clic Cancel to exit the w	k Back to izard.	
· · · · · · · · · · · · · · · · · · ·			
Back	Remove	Cano	el
	•		

The dialog will update once MLSuite is successfully uninstalled. Click Finish to exit.



Appendix A – Server Configuration

A.1 Use of Multiple Drives

Using multiple drives with dedicated functions improves performance. It is recommended for all setups, be it two-tier, three-tier or even single server.

Recommended setup of the multiple drive system is three SSDs on the Back-End server:

- Local Drive for Operating System.
- Database Drive for storing database files.
- Temp Drive for storing TEMP folders and Page files.

Database Drive Setup

The Database drive is where the database files are to be stored. Ensure that a folder exists, that is accessible from MLWeb where these files can be stored.

If the multiple drive method is being deployed on a machine with MLSuite already installed, **the Firebird and MLServer services must be stopped in Windows Services.** If they are not stopped, errors may occur, and the databases may be corrupted. **Firebird must be stopped first and then MLServer**.

After both services have been stopped, the Database folder can be moved. Ensure that the Database folder is copied from the previous drive onto the Database drive, and then removed entirely from the previous drive.



If MLSuite was already installed and databases were present, their location has now changed and MLAdmin must be updated to reflect this.

Updating Database Location in MLAdmin

Open MLAdmin and navigate to the Databases workspace. In the **Database Path** field, update the path to the new location and **Save**.

After the databases have been moved and the file paths have been updated to reflect the move, restart the Firebird service first, then restart the MLServer service.

Temp Drive Setup

The Temp drive must be set to the location where TEMP folders and Page files are generated.

Open the System Environment Variables feature by clicking the start menu and type "System Environment Variables."



Moving TEMP Folders to the Temp Drive

From the Advanced tab of the System Environment Variables form, click the Environment Variables button.

System Properties	Х
Computer Name Hardware Advanced Remote	
You must be logged on as an Administrator to make most of these changes Performance Visual effects, processor scheduling, memory usage, and virtual memory	
Settings	
Desktop settings related to your sign-in	
Settings	
Startup and Recovery System startup, system failure, and debugging information	
Settings	
Environment Variables	
OK Cancel Apply	

In the System Variables list, scroll to TEMP and select it.

From the **Edit System Variables** dialog, change the **Variable Value** to the path of the Temp drive followed by **\Windows\Temp**.

For example, if the Temp drive is **F:**, enter **F:\Windows\TEMP**.

Variable	Value				
Path	%USERPROFILE%\/	AppData\Local\Micros	oft\WindowsApps;		
TEMP	%USERPROFILE%\A	AppData\Local\Temp			
TMP	%USERPROFILE%\/	AppData\Local\Temp			
		Edit System Variable			
		Variable name:	TEMP		
ystem variables		Variable value:	F:\Windows\TEMP		
Variable	Value				
PROCESSOR_REVISION	3e04	Browse Directory	. Browse File	5. . .	OK Cance
PSModulePath	%ProgramFiles%				
TEMP	F:\Windows\TEMP				
TMP	F:\Windows\TEMP				
USERNAME	SYSTEM				
windir	C:\Windows			~	

Repeat this step for **TMP**.



Using the previous example, F:\Windows\TEMP would be entered in the Variable Value field for TMP.

Edit System Variable		<
Variable name:	ТМР]
Variable value:	F:\Windows\TEMP]
Browse Directory	Browse File OK Cancel]

After these steps are complete, the server should be rebooted.

Confirm that the changes were made correctly by checking the TEMP folder in the Temp drive and seeing that TEMP files are being generated.

Login to MLWeb and confirm that it is running.

Update MLServer with Temp Location (Optional)

If using a custom temp folder:

Open the MLServer.ini file located within the CanarySys folder.

Open the file using Notepad++, under [General] there is a "TempFolder=" field. Add the path to the Temp drive.

```
[General]
Statistics=False
Statistics.TopEventTimeFilter=0
Statistics.ChildEventTimeFilter=0
PythonPath=
ReportJPEGHiRes=False
ReportJPEGQuality=95
CalcEngineThreadCount=0
DomainController=
ProcessAccount.UserName=canary_process
TempFolder=F:\Windows\TEMP
```



Note

By default, MLServer uses the Windows temp folder (MLServer subfolder).





A.2 MLSuite TCP Port Diagram





Appendix B – Installing MLSuite Components Locally

Installing MLReport Locally

Canary Systems recommends installing MLReport on your local machine and **not** on the same server that hosts MLWeb. To do this, follow the steps outlined below:

- **1.** Download the installer from the Canary Systems website and begin the installation as outlined in section 2.5 Installing MLSuite.
- MLReport is the ONLY feature that should be installed. From the Custom Setup wizard, disable all features other than MLReport. This is done by selecting Entire feature will be unavailable as shown in the figure below.

🖟 Multilogger Suite 2	2023.0.0 Setup		_		×		
Custom Setup Select the way you	u want features to be installe	ed.	САЛ	IA	RY TEMS*		
Click the icons in th	ne tree below to change the	way features w	vill be installed.				
	Itilogger Suite Multilogger MLReport	Firebird d	latabase SQL se	erver v2.5	i		
	MLServer MLGateway MLWeb Utilities Firebird Server	This feat hard drive	ır				
Will be installed on local hard drive Entire feature will be installed on local hard drive							
× Entire feature will be unavailable							
Reset	Disk Usage	Back	Next	Cano	el		

See section 1.2 Configure Database Connection of the **MLReport User's Guide** (canarysystems.com/support/usersguides) for details on connection configuration.

111	
11	

Hint

If connecting to MLServer on a remote server, firewall configuration may be required. For more information on configuring firewall rulesm see section 2.2 *Firewall Configuration.*

B.2 Installing the MLWeb Icon Library Locally

The MLSuite installer includes a utility option for installing a library of standard MLWeb Icons.

If accessing MLWeb from the server where MLSuite is installed these can be found in a folder called **Icons** under the **CanarySys** folder.



If accessing MLWeb from a machine other than the server MLSuite is installed on, the Icon Utility option can be installed on a local machine. This is done by running the installer and setting all features to "Entire feature will be unavailable" except for the Icon utility.

🕼 Multilogger Suite 2023.0.0 Setup	– 🗆 X
Custom Setup Select the way you want features to be installed.	(CANARY
Click the icons in the tree below to change the way	y features will be installed.
X • MLReport MLServer MLGateway MLWeb Utilities Utilities Utilities MLPerfIndex IBOConsole Icons	Firebird database SQL server v2.5 This feature frees up 15MB on your hard drive.
Will be installed on loca Will be installed on loca B Entire feature will be ins K Entire feature will be un Reset	I hard drive talled on local hard drive available

This creates the CanarySys folder along with the Icon subfolder where the icon library can be accessed through MLWeb from the local machine.



Appendix C – Migration from MLWeb 2021 to MLWeb 2023

MLWeb 2023 has been enhanced in numerous critical ways which make it incompatible with previous Canary Systems browser-based applications and associated components. Follow the example migration in this appendix to ensure the most complete transfer of databases from the previous generation MLWeb to MLWeb 2023.



Note

Depending on the complexity of the database, Canary Systems recommends using a dedicated migration server for MLWeb 2021 to MLWeb 2023. upgrades. Contact Canary Systems Support for questions regarding specific setups.

C.1 Backing Up Existing Database Files

Databases can be manually backed up using the Backup Database operation in MLAdmin. For migration from MLWeb 2021 to MLWeb 2023, only the Firebird database needs to be backed up.

The operation creates a **Database Backup** file, or **.gbk** file, stored in a zipped folder (*.zip*). The .gbk file's name format is the database name. The zipped folder's name format is the database name followed by the date and time of the backup: *Database_yyyymmddhhnn.zip*.

To manually backup a database:

- 1. Navigate to MLAdmin.
- **2.** Expand the **Sites** tab and then select the site to be backed up. Doing this open's the site's Manage Databases workspace. Alternately, clicking Manage within the general Sites workspace opens the Manage Databases workspace.
- **3.** In the Manage Databases workspace, under the Firebird database heading, click Backup Database. A zip file (*.zip*) containing the backup file (*.gbk*) is created and downloaded.

😤 Status	=		O admin
Sites Configuration Configuration	Manage demolog Database Firebird database E Backup Database Restore Outstate Restore Outstate Run Script	Postgres database Current Version: 32	

This .gbk file can be used to restore the database in MLWeb 2023 once the new version of the software has been installed.



For more information on MLAdmin, see Chapter 21 – MLAdmin of the MLWeb User's Guide 2019.



Note

If **not** using a migration server, 3D objects, as well as inclinometer, TDR, and SAA chart data must be noted and/or saved separately from the database backup. **IMPORTANT: these database items will not transfer over to MLWeb 2023 and must be manually added after databases are restored in the upgraded software.** For more information on this process continue to section *C.3 Migrating Reports, Charts, Objects, and Scenes.*

C.2 Uninstall MLSuite and Components

Note

The steps here are specific to the process for uninstalling previous editions of MLSuite in preparation for an upgrade to new software and differ from the process as laid out in section 7 of this guide.

C.2.1 MLGateway License Deactivation

Before removing MLSuite, the Gateway License for MLGateway must be deactivated on the current machine to allow it to be reactivated on another. This can be done through MLWebHardware or MLGateway.

Once the license for MLGateway is deactivated, the licensed databases in MLAdmin must also be deactivated. This is described in section *C.2.2 Database Licenses Deactivation*.

License Deactivation through MLWebHardware

Open **MLGateway** and click the **License** tab. This brings up a list of configured licenses, as shown in the figure below. Select the license you wish to delete and click the **Delete** button to deactivate the license.

(CANA	SYSTEMS 2021	/ebHardware 1.0.0.76			i Q admin
		HOME SERVER LICENSE			
HOME Server Settings	~		🖊 Edit		
Information		Active License Key	Туре	Activation Code	
License			G25		*
SUPPORT	>				
MLDAQ					
MCLOG					
MLTDR					
MLBase					-
MLSAA					



License Deactivation through MLGateway

Open **MLGateway** and click the **License** button. This will bring up the **Configure Licensing form**, as shown in the figure below. Highlight the license and click the Delete Record button to deactivate the license.

1. Contraction of the second s	🤌 Co	nfigure Licensing		×
	Valid	License Key	Authorization Code	Туре
	8	0000 0000 0000 0000	7123 5619 89A8 E9C0 🛛 …	50
			License count:	50
	81 4	> > + - <		>
			Close	

C.2.2 Database License Deactivation

In addition to deactivating the Gateway License, all database license keys should also be removed. This will allow them to be preserved and reused later.

Open **MLAdmin** and click the **Database** tab. From the Databases workspace click the Edit button to make note of the License Key for future use.

Close the License form and click **Delete** to remove the license from the database.

Repeat for all database license keys.

☆ Status	≡			💽 adm
Sites Background lobs	Databases			
 Configuration 	Active Alias	Database Path (local path on Firebird Host/Server)	Used/Licensed	Operations
Passwords	1 🗸 exam	Die D:\Databases\firebird\example.gdb	0 / 0	₽ Licenses ✔ Edit ★ Delete Health Status
Databases Email Sender & Dashboard Config	Add Database	used in Sites, none		



C.2.3 MLSuite Removal

Uninstalling Using the Control Panel

To remove MLSuite, open the **Programs and Features** menu of the Control Panel. Locate **MLSuite** in the list of programs and click **Uninstall** to begin the removal process.

o	Programs and Features					- 🗆	×
~	> -> 🛧 👩 > Control Pa	anel > Programs > Programs and Features				ע ט Search Pr	P
	Control Panel Home	Uninstall or change a program					
	View installed updates	To uninstall a program, select it from the list and then	click Uninstall, Change, or	Repair.			
•	Turn Windows features on or	lor					
	 Programs and Features Control Panel Home Control Panel Home Uninstall or change a program Turn Windows features on of Turn Windows features on or Install a program from the network Organize Uninstall Change Repair Name Publisher Notepad++ (64-bit x64) Notepad++ Te Multilogger Suite 2019.0.0 Canary System Google Chrome Google Chrome Google Chrome Google Chrome Microsoft ASP.NET Core 2.2.7 - Shared Framework Microsoft Core Micr					?	
	rograms and Features →	Name	Publisher	Installed On	Size	Version	^
		📓 Notepad++ (64-bit x64)	Notepad++ Team	3/26/2020	9.40 MB	7.8.5	
		Ҝ Multilogger Suite 2019.0.0	Canary Systems, Inc.	3/20/2020	1.74 GB	19.0.0.479	
		💿 Google Chrome	Google LLC	3/19/2020	400 MB	80.0.3987.149	
		😸 Microsoft ASP.NET Core 2.2.7 - Shared Framework	Microsoft Corporation	3/13/2020	103 MB	2.2.7.0	
		😸 Microsoft .NET Core Runtime - 2.2.7 (x64)	Microsoft Corporation	3/13/2020	89.4 MB	2.2.7.28009	
		Hicrosoft .NET Core 2.2.7 - Windows Server Hosting	Microsoft Corporation	3/13/2020	286 MB	2.2.7.0	~
View installed updates To uninstall a program, select it from the list and then click Uninstall, Change, or Repair. Install a program from the network Organize Uninstall Change Repair Name Publisher Installed On Size Version Notepad++ (64-bit x64) Notepad++ Team 3/26/2020 9.40 MB 7.8.5 Multilogger Suite 2019.0.0 Canary Systems, Inc. 3/20/2020 1.74 GB 19.0.0.479 Google Chrome Google LLC 3/19/2020 400 MB 80.0.3987.14 Microsoft ASP.NET Core 2.2.7 - Shared Framework Microsoft Corporation 3/13/2020 103 MB 2.2.7.0 Microsoft .NET Core Runtime - 2.2.7 (x64) Microsoft Corporation 3/13/2020 89.4 MB 2.2.7.28009 Microsoft .NET Core 2.2.7 - Windows Server Hosting Microsoft Corporation 3/13/2020 286 MB 2.2.7.0 Microsoft Loper Instell Hep link: http://canarysystems				anarysystems.com systems.com/support/s	oft		

A message box is displayed, asking to confirm removal of MLSuite. Click **Yes** to continue to uninstall.

Uninstalling Using the MLSuite Installer

An alternative way to uninstall the software is to run the installation program again. This displays the **Program Maintenance** form, as shown in the figure below.

Select Remove, then Next to continue.

🕼 Multilogger Suite 2019.0.0 Setup	_		×
Change, repair, or remove installation			
Select the operation you wish to perform.	AI	VA	TEMS*
Change Lets you change the way features are installed. Repair Repairs errors in the most recent installation by fixing missin files, shortcuts, and registry entries.	ng and (corrupt	
Remove Removes Multilogger Suite 2019.0.0 from your computer.			
Back Next		Can	cel



The next dialog box includes a message asking to confirm the removal of MLSuite. Click **Remove** to continue.

🛃 Multilogger Suite 2019.0.0 Setup	_		×
Ready to remove Multilogger Suite 2019.0.0	(CA	NA	RY YSTEMS
Click Remove to remove Multilogger Suite 2019.0.0 from review or change any of your installation settings. Click C	your computer. C Cancel to exit the	Click Back to wizard.	
Prof.	Deserve		

The dialog will update once MLSuite is successfully uninstalled. Click **Finish** to exit.

C.2.4 Uninstall Components

Return to the **Programs and Features** menu of the Control Panel. Unistall the associated components of MLSuite in the reverse order to which they were originally installed.

1. From Programs and Features, uninstall existing version of .NET Core Runtime and all associated components (in any order).

Programs and Features						- 0	×
← → × ↑ 🖸 « Programs	s > Programs and Features v Ö Search	Programs and Features					Q
Control Panel Home	Uninstall or change a program						
View installed updates	To uninstall a program, select it from the list and then	click Uninstall, Change, or Repair.					
💡 Turn Windows features on or							
off	Organize 🔻 Uninstall Change						?
	Name	Publisher	Installed On	Size	Version		^
	Measurand.Software.Installer 2022.02	Measurand Instruments Inc	2/2/2023	210 MB	2022.02		
	Studio Microchip Studio	Microchip	3/29/2023	5.03 GB	7.0.2594		
	Microsoft .NET Core 2.1.30 - Windows Server Hosting	Microsoft Corporation	1/9/2023	272 MB	2.1.30.60071	1	
	Hicrosoft .NET Core Runtime - 2.1.30 (x64)	Microsoft Corporation	1/9/2023	89.5 MB	2.1.30.30411		
	Hicrosoft .NET Core Runtime - 2.1.30 (x86)	Microsoft Corporation	1/9/2023	78.6 MB	2.1.30.30411		
	III Microsoft .NET Framework 4.5 Multi-Targeting Pack	Microsoft Corporation	3/29/2023	41.8 MB	4.5.50710		
	III Microsoft .NET Framework 4.5.1 Multi-Targeting Pack	Microsoft Corporation	3/29/2023	49.3 MB	4.5.50932		
	III Microsoft .NET Framework 4.5.1 Multi-Targeting Pack	Microsoft Corporation	3/29/2023	74.5 MB	4.5.50932		
	Microsoft .NET Framework 4.5.1 SDK	Microsoft Corporation	3/29/2023	19.4 MB	4.5.51641		
	Microsoft .NET Framework 4.5.2 Multi-Targeting Pack	Microsoft Corporation	3/29/2023	49.4 MB	4.5.51209		
	Microsoft .NET Framework 4.5.2 Multi-Targeting Pack	Microsoft Corporation	3/29/2023	74.4 MB	4.5.51209		
	S Microsoft 365 Apps for business - en-us	Microsoft Corporation	7/17/2023		16.0.16529.20182	1	
	C Microsoft Edge	Microsoft Corporation	7/17/2023		114.0.1823.82		
	📨 Microsoft Edge WebView2 Runtime	Microsoft Corporation	7/17/2023		114.0.1823.82		
	🔂 Microsoft Help Viewer 2.2	Microsoft Corporation	3/29/2023	12.1 MB	2.2.23107		
	Microsoft ODBC Driver 18 for SQL Server	Microsoft Corporation	1/16/2023	7.07 MB	18.1.2.1		
	 Microsoft OneDrive 	Microsoft Corporation	7/20/2023	283 MB	23.142.0709.0001		
	📒 Microsoft SQL Server 2014 Management Objects	Microsoft Corporation	3/29/2023	25.8 MB	12.0.2000.8		
	Microsoft System CLR Types for SQL Server 2014	Microsoft Corporation	3/29/2023	6.83 MB	12.0.2402.11		
	Microsoft Corporation Product version: Size: 2	2.1.30.60071 272 MB					

2. From Program & Features, uninstall existing PostGIS bundle as well as Npgsql (any order).



3. Finally, uninstall existing version of PostgreSQL.

Programs and Features						- 🗆	Х
← → × ↑ 🖬 « Programs	s > Programs and Features v 🖏 Search	Programs and Features					Q
Control Panel Home	Uninstall or change a program						
View installed updates	To uninstall a program coloct it from the list and then	lick Uninstall Change of Penair					
Turn Windows features on or	to uninstall a program, select it from the list and then	lick oninstall, change, or Repair.					
off	Organize 🔻 Uninstall/Change						
	Name	Publisher	Installed On	Size	Version		
	Microsoft Visual Studio 2015 Shell (Isolated)	Microsoft Corporation	3/29/2023	1.56 GB	14.0.23107.10		
	II MPLAB XC8 C Compiler	Microchip	3/29/2023	1.80 GB	v2.36		
	K Multilogger Suite 2021.4.0	Canary Systems, Inc.	7/19/2023	904 MB	21.4.0.6		
	Wotepad++ (64-bit x64)	Notepad++ Team	7/11/2023	18.5 MB	8.5.4		
	III Npgsql 3.2.6	EnterpriseDB	1/9/2023	4.81 MB	3.2.6-3	1	
	NVIDIA Graphics Driver 517.89	NVIDIA Corporation	2/24/2023		517.89		
	NVIDIA PhysX System Software 9.21.0713	NVIDIA Corporation	2/24/2023		9.21.0713		
	pgAdmin 4 version 6.19	The pgAdmin Development Team	1/26/2023	650 MB	6.19		
	PostGIS Bundle 3.0.3 for PostgreSQL x64 12 (remove		1/9/2023				
	PostgreSQL 12	PostgreSQL Global Developmen	1/9/2023	891 MB	12		
	🔜 PowerToys (Preview) x64	Microsoft Corporation	4/17/2023	0.98 GB	0.69.1		
	PuTTY release 0.78 (64-bit)	Simon Tatham	1/31/2023	5.53 MB	0.78.0.0		
	PyCharm Community Edition 2022.3.2	JetBrains s.r.o.	3/3/2023		223.8617.48		
	🄄 Python 3.11.1 (64-bit)	Python Software Foundation	1/16/2023	142 MB	3.11.1150.0		
	🐙 Python Launcher	Python Software Foundation	1/16/2023	1.43 MB	3.11.8009.0		
	😹 Realtek Audio Driver	Realtek Semiconductor Corp.	4/28/2023	401 MB	6.0.9472.1		
	WRealtek USB Ethernet Controller All-In-One Windows	Realtek	1/23/2023	6.68 MB	10.54.608.2022		
	🔄 Snagit 12	TechSmith Corporation	6/2/2023	301 MB	12.4.1.3036		
	Spiceworks Agent	Spiceworks, Inc.	1/5/2023	3.62 MB	10.0.6.0		

C.3 Migrating Reports, Charts, Objects, and Scenes

Because of enhancements to MLWeb 2023, such as new charting and GIS engines, special attention is called for when migrating certain database items from legacy software. Carefully review the following guidelines to ensure the most complete and accurate migration of databases from MLWeb 2021 to MLWeb 2023.

Note

Canary Systems has implemented an entirely new mapping/GIS engine in MLWeb 2023 featuring numerous enhancements including dual 2D/3D scenes. **Image Windows as found in legacy versions of the software are no longer supported.** For information on machine settings for best reaults when viewing 3D data, reference the **MLWeb User's Guide 2023.**

C.3.1 Custom Reports

Certain table and column names have changed in MLWeb 2023 and must be updated in any SQL code via MLReport in order for Custom Reports to display correctly in the software. For more information on scripting in MLReport, refer to the *MLReport User's Guide* (canarysystems.com/support/users-guides).



For changes to the table and column names, see Appendix F – Table and Column Name Updates in MLWeb 2023.



C.3.2 Charts

Select fields from the Outputs Configuration Side Panel in MLWeb 2021 are now instrument properties in MLWeb 2023. These configurations do not migrate to MLWeb 2023 automatically and must be entered manually. **TDR, Inclinometer, and SAA charts will not display accurately until these properties have been updated.**



Use the below sections to determine how fields from MLWeb 2021 Output Configuration Side Panel fields correlate to MLWeb 2023 instrument properties.

TDR Charts

The fields that must be entered as properties in MLWeb 2023 are found by opening the Outputs Configuration Side Panel for the chart being worked on in MLWeb 2021 and then navigating to the **Type** tab.





In MLWeb 2023, navigate to the corresponding Property within the Instrument and then enter the data from each MLWeb 2021 field using the **Add new** button. A list of MLWeb 2021 Outputs Configuration Side Panel fields and the properties that each correspond to in MLWeb 2023 is found below.

(CANA	RY				Start typing			Q		Help 🗸 🖉 🗸
ŵ	🖯 Dat	abase / 🖿 CanaryDemo / 📕	Instruments	/ 🖿 TDR /	Data / 📢 TDR_1001_	CH01 (Instrument)			Cancel	Save
Home	IN	STRUMENT SETTINGS	DATA	ITEMS	ATTACHMENTS	NOTES				
Status Dashboarda	Type: /	ul ~								+ Add new
Reports	Туре	Name 😝					Status / Size	Details		
Database	%	AvgConfig						Last Data: 7/10/2015 12:00:00 AM 128 Value Type: Numeric Description: Avg_Config		
\bigcirc	%	Baseline						Value Type: Date Description: Baseline		
Imports	%	CableLength						Last Data: 7/10/2015 12:00:00 AM (0) Value Type: Numeric Description: Cable_Length		
Objects	%	DistanceUnits						Value Type: List Description: DistanceUnits		
Classes	%	EndPoint						Value Type: Numeric Description: EndPoint		
Administration	%	FileName						Value Type: String Description: FileName		
	%	Installation						Value Type: List Description: Installation		
	%	Multiplier						Last Data: 7/10/2015 12:00:00 AM 1 Value Type: Numeric Description: Multiplier		
	%	Offset						Last Data: 7/10/2015 12:00:00 AM (0) Value Type: Numeric Description: Offset		
	%	Points						Last Data: 7/10/2015 12:00:00 AM 1500 Value Type: Numeric Description: Points		
	%	ProbeLength						Last Data: 7/10/2015 12:00:00 AM 🔘 Value Type: Numeric Description: Probe_Length		
	%	ProbeOffset						Last Data: 7/10/2015 12:00:00 AM (0) Value Type: Numeric Description: Probe_Offset		
	%	ProjectName						Value Type: String Description: ProjectName		
	%	Reference						Value Type: Numeric Description: Reference		
MLWebHW	%	SerialNumber						Value Type: String Description: SerialNumber		

Chart Type – This field migrates automatically; no action is necessary.
Orientation – Corresponds to the Installation Property in MLWeb 2023.
Units – Corresponds to the DistanceUnits Property in MLWeb 2023.
Waveform start – Corresponds to the Start point Property in MLWeb 2023.
Waveform end – Corresponds to the End point Property in MLWeb 2023.
Elevation – Corresponds to the Reference Property in MLWeb 2023.

Note

When entering this data in MLWeb 2203, it is important to remember to always set the Recorded field of the **New Data** side panel to a date and time prior to the first data included in the chart being migrated.



Inclinometer/SAA Charts

For Inclinometer/SAA charts in MLWeb 2021, there are two tabs in the Outputs Configuration Side Panel that contain information which must be manually added to the migrated charts in MLWeb 2023: the Configuration tab and the **Type** tab.



A list of applicable Configuration tab chart columns and the properties that each correspond to in MLWeb 2023 is found below.



A-Axis GF - Corresponds to the GageFactorA Property in MLWeb 2023.

B-Axis GF - Corresponds to the GageFactorB Property in MLWeb 2023.

A-Axis Bias - Corresponds to the BiasA Property in MLWeb 2023.

B-Axis Bias - Corresponds to the BiasB Property in MLWeb 2023.



A list of applicable Type tab fields and the properties that each correspond to in MLWeb 2023 is found below.

Hinclinometer Cumulative Deviation			
Inclinemeter Cumulative Deviation Inclinemeter Cumulative Deviation Inclinemeter Cumulative Deviation 10.00 -10.00 -20.00 -30.00 -60.00 -70.00 -80.00 -90.00 -00.00	Inclinometer Chart Cumulative Deviation 1/19/2015 07:58/22 1/28/2015 11/28/2015 10:051 2/2/2015 10:051 2/2/2015 10:051 2/2/2015 10:251 2/2/2015 11:36.31 2/2/2015 12:17:01 UB Limit - B High Limit - B	* ×	Level ▼ Configuration Axis Appearance Background Sildeshow Annotations Output Alarms Chart Type Cumulative Deviation ▼ Reference Bottom Bottom ▼ Level ▼ Pepth Units ▼ Feat ▼ Stickup 0 0 — Angle 0
-20.000.0020-20.0 - A Axis	00.00 20.00 - B Axis		0

Chart Type – This field migrates automatically; no action is necessary.

Reference – Corresponds to the Direction Property in MLWeb 2023. After selecting the **Add new** button to bring up the New Data slider, the NearToFar selection corresponds to the Bottom selection in MLWeb 2021; the Far ToNear selection corresponds to the Top selection in MLWeb 2021.

Reading Units - Corresponds to the ReadingUnits Property in MLWeb 2023.

Depth Units - Corresponds to the DistanceUnits Property in MLWeb 2023.

Stickup - Corresponds to the Stickup Property in MLWeb 2023.

Elevation - Corresponds to the Reference Property in MLWeb 2023.

Angle - Corresponds to the Azimuth Property in MLWeb 2023.

Note

When entering this data in MLWeb 2023, it is important to remember to always set the Recorded field of the **New Data** side panel to a date and time prior to the first data included in the chart being migrated.

C.3.3 Objects and Scenes

For full functionality given the enhanced GIS engine, scenes from legacy edition software must be rebuilt for MLWeb 2023. For information on scenes, refer to the *MLWeb User's Guide 2023* (canarysystems.com/support/users-guides).



Appendix D – Creating Canary Process Account

The MLAdmin site includes an option for a Windows process username and password. This is referred to as the Process Account or Canary Process Account and is required for various processes to run properly without requiring elevated privileges.

D.1 Windows Process User Requirements/Rights

The Windows Process user can be a local account on the server or a Windows Domain account.

The account should be setup so that the password meets the complexity requirements and configured so that the password never expires.

When entering the username and password in MLAdmin, if the account is a local account (created on the server), enter the username of the account with the password you have configured (refer to section *4.1 Installation Setup*). If the account is a Windows Domain account, the username must be entered as username@domain (i.e. Canary_Process@canary.local).

D.2 Standardize name as Canary_Process

To standardize deployments, use **Canary_Process** for the username for either a local account or a Windows Domain account.

Creating a Local User Account

- 1. From the Start menu, navigate to **Computer Management**.
- 2. In the lefthand panel, expand Local Users and Groups and then right click on Users.
- 3. Choose New User from the drop-down menu. A new window appears.

Tomputer Management					-		×
File Action View Help							
🗢 🔿 🙍 📷 🙆 📓 💼							
Computer Management (Local)	Name	Full Name	Description	٨	ctions		
V 👔 System Tools	2 Administrator		Built-in account for administering	U	lsers		
 Image Scheduler Ima	Cuest Guest Spiceworks		A user account managed by the s Built-in account for guest access t A user account managed and use		More Action	5	•
Creates a new Local User account.	0						

4. Enter the name "Canary_Process" and add a description if desired.



5. Enter a password that meets the local system's password policy, confirm the password, uncheck the box. **User must change password and next logon**, and check the box **Password never expires**.

New User			?	×
User name:	Canary_Process			
Full name:	Canary_Process			
Description:	Canary Process Account			
Password: Confirm passwo	rd:			
User cannol	change password			
Account is a	isabled			
Help		Create	Clo	se

6. Click the **Create** button to create the Process Account.

D.3 Permissions needed for Canary_Process Account

After a Windows Process user has been created and set up in MLAdmin, permissions to specific folders on the server running MLServer need to be granted for this account. The account needs "modify" access to:

- The **CanarySys** folder (and all subfolders) wherever that is located. By default, this is under C:\Users\Public\Documents\CanarySys, but is often moved to the root of one of the data drives on the server.
- The **Windows\Temp** folder (and all subfolders) wherever that is located. By default, this is located in C:\Windows\Temp, but that can be moved by changing the system environment variables.
- In addition, if Python scripts are executed through MLServer, the Canary_Process account requires
 modify access to the location where the **Python executables** are installed.



Appendix E – Performance Index Tool

MLSuite includes a tool which can aid in optimizing server performance: MLPerfIndex.

After launching MLPerfIndex, simply click on the Recalculate button to launch the indexing process.

Be advised that this process makes heavy use of all system resources while it's running. It is advisable to run indexing only during times of low or preferably no other traffic in order to avoid disruptions to other users and processes, as well as to obtain as good a baseline as possible without external interference.

帐 Performance Index C	alculator X
CPU (8 cores)	12099
Single Core:	1512
RAM	573
Disk C:	228
Sequential Write:	309.02 MB\Sec
Sequential Read:	314.67 MB\Sec
Random Read:	6.14 MB\Sec
Disk D:	232
Sequential Write:	313.81 MB\Sec
Sequential Read:	319.38 MB\Sec
Random Read:	6.23 MB\Sec
Disk F:	69
Sequential Write:	108.44 MB\Sec
Sequential Read:	96.4 MB\Sec
Random Read:	68 KB\Sec
Disk G:	49
Sequential Write:	72.32 MB\Sec
Sequential Read:	73.8 MB\Sec
Random Read:	64 KB\Sec
Total Index	12816
I/O block size: 16 KB	✓ Force Write
Recald	ulate

Two options are available, and should be left at their default values:

- I/O Block Size: 16 KB
- Force Write: (unchecked)

Acceptable index values are as follows:

- Single logical CPU: 1100 1500
- Total CPU (8 cores): 9000 12000
- **RAM:** 500-600
- Disk: 200 or higher (values lower than 200 indicate non-SSD hard drives with higher read/write latency)



This tool simulates the day-to-day workload of navigating and reading/writing the Firebird database at the core of MLSuite. Due to the specific environment simulated with MLPerfIndex, the results are likely to differ from third-party tools such as *CrystalDiskMark* for drive benchmarking or *Cinebench* for CPU benchmarking.

The *MLPerfIndex* score is split into three broad categories: CPU, Memory (RAM) and Storage. These scores are then combined into a single, final score.

CPU

The CPU test measures the processor's floating-point performance by leveraging all available cores at once. The threads run in real-time (highest) priority to avoid the influence of other processes, but it is recommended to close other applications anyway. During the test, the mouse pointer might appear frozen or lagging; this is normal.

The more cores the test machine has, the higher the performance index score. Also shown in the CPU index is the singlecore performance index where only a single core is tested to represent a lighter workload.

Memory

Memory performance is measured in a single thread (one CPU core) by allocating and releasing 1MB blocks of memory in a loop. The score on this section of the test scales with the number of cycles per second (MHz) the RAM is capable of, so the faster the RAM speed, the higher the performance index score. More RAM, such as having 64GB instead of 16GB, does not necessarily result in a higher performance index score. The DDR revision of the memory tested also impacts scores, mainly because newer revisions have much higher base speed when compared to older revisions. Basic DDR5 memory (4800MHz), such as that found in newer workstations, can score around 1000 points. Basic DDR4 memory (2133MHz) scores closer to 300-500.

File System

The file system performance is measured in a single thread (one CPU core) by creating, writing, reading, and then deleting a 16K block in a loop. Higher scores indicate faster sequential read and write speeds, along with faster random read speeds. Much of the score is dependent on the IOPS (Input/Output Operations per Second) of the drive and the access time, where higher IOPS and lower access times will lead to higher scores. A basic spinning disk hard drive (HDD) with a mechanical, moving drive head will score low due to long (up to 5ms) access time and low IOPS (max 400 for high-RPM drives). A solid-state drive (SSD) with no mechanical parts is no longer limited by the access time of a moving drive head, leading to lower access time and higher IOPS (75000+). An NVMe SSD is even faster, with IOPS over 1,000,000 in certain cases.

Canary Systems recommends at least a solid-state drive (SSD) for Firebird database storage and operation.



Note

An additional consideration regarding drive speed is physical vs. virtual storage. In the case of a virtual machine (VM) running MLSuite, in which case storage is often managed via a SAN or NAS drive, speed losses of between 20% and 80% are expected when under load. SAN/NAS are effective for transferring hundreds of MBs from one location to another but fail to keep up with hundreds of thousands of tiny blocks of data commonly seen with Firebird databases. A physical drive dedicated to just Firebird is recommended for maximum performance.



Appendix F – Firebird Table and Column Name Updates in MLWeb 2023

Old Table Name	New Table Name	Old Column Name	New Column Name
Data	alamant	data_element	ID
Data	element	Entity_class_nbr	Entity_class_id
Data	Dataclement data	data	num_value
Data	Dataelement_data	data_element	Dataelement_id
Enti	ty_Class	Entity_class_nbr	ID
Users	Security_user		

canarysystems.com



Appendix G – Advanced MLServer .ini Settings

The MLServer *.ini* settings may need to be modified for various reasons. The *.ini* file is located in the **CanarySys\MLServer** folder. To edit the file, open it using Notepad or a similar tool, navigate to the section where changes are needed. Once the changes are made **Save** and **Close** the file.

Note
After the settings are changed and the MLServer .ini file is saved, the MultiLogger: MLServer service must be restarted from the Windows Services application.

G.1 CalcEngineThreadCount

The default value is "CPU Virtual Cores" multiplied by 4. Default value is used when the override is missing in **MLServer.ini** or it is equal to 0.

[General]

CalcEngineThreadCount=8

In some cases, to avoid server overload, default should be changed to a lower value.

MLServer.ini - Notepad	_		×			
File Edit Format View Help						
[General]			^			
Statistics=False						
Statistics.TopEventTimeFilter=0						
Statistics.ChildEventTimeFilter=0						
PythonPath=						
ReportJPEGHiRes=False						
ReportJPEGOuality=95						
CalcEngineThreadCount=0						

CalcEngineTreadCount highlighted in the .ini file.



G.2 Processing

In a database with data going back for an extended period of time restricting how far back to look before setting off alarms is possible by adding a setting to the .ini file.

[Processing] DontProcessOlderThan=45

Any data older than the number of days specified as the DontProcessOlderThan value will not be processed for alarms, notifications and calculations. If the DontProcessOlderThan value is not set in **MLServer.ini**, the database looks back 90 days by default.

	*MLSe	rver.ini - N	lotepad	(_3	×
File	Edit	Format	View	Help		
[Pro	ocess	ing]				^
Dont	tProd	ess01d	erTha	n=45		~

Note

This setting is not in the .ini file by default. If specifying the number of days to for processing it needs to be added manually.

G.3 Notification Email Fields

The Database Name and Server URL fields of Notification Emails can be configured with the **MLServer.ini** file. This file is found in the CanarySys folder at the following path: **C:\Users\Public\Documents\CanarySys\MLServer**.

Under the **[Domain]** section of MLServer.ini, enter the desired database alias or server URL to be used for the database. If both are to be used, separate them with a semicolon.



The Database Name and Server URL fields configured in the MLServer.ini file.

Server UR	a http://geomonitoring.com/demol	
_	L. <u>map.ageomonitoring.com/demon</u>	po
Schedule	d Output Notification	
e following	automated outputs have been generated:	
e renorming	ancountrea onthere une neer Beueraren	
Output	Posted Time	

The Database Name and Server URL fields as they appear in a Notification Email.



G.4 Configuring MLServer for Python Script Imports

Before MLServer can run Python scripts, the path to the location of **python.exe** must be specified in the **MLServer.ini** file. This file is found in the CanarySys folder at the following path: **C:\Users\Public\Documents\CanarySys\MLServer**.

Under the **[General]** section of MLServer.ini is the **PythonPath=** parameter. The path to where – on the machine running MLServer – python.exe is entered in this parameter.

MLServer.ini - Notepad	_	×
File Edit Format View Help		
[General]		^
Statistics=False		
<pre>Statistics.TopEventTimeFilter=0</pre>		
Statistics.ChildEventTimeFilter=0		
PythonPath=C:\Users\Public\python.exe		
		\sim

The PythonPath= parameter of the MLServer.ini file.

After the path is entered and the MLServer.ini file is saved, the **MultiLogger: MLServer** service must be restarted from the Windows **Services application**. MLServer is then able to run Python Scripts.

