

Oracle Utilities Live Energy Connect Asset ID Manager User Guide

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Getting Started

The Oracle Utilities Live Energy Connect (LEC) Asset ID Manager (AIM) is designed to automate and maintain the alignment of an organization's Supervisory Control and Data Acquisition (SCADA) or Energy Management System (EMS) system configurations, LEC Server configurations, and Oracle Utilities Network Management System (NMS) or CGI's PragmaLINE Outage Management System (OMS) system configurations. The following are some tasks LEC AIM can automate:

- Generating LEC Server batch files from points configured on a SCADA system or EMS
- Loading LEC Server batch files into the LEC Server remotely
- Mapping the points in these batch files to NMS devices and device attributes or CGI OMS devices and device attributes
- Loading the resolve mappings into an NMS configuration or a CGI OMS configuration

After the LEC AIM application synchronizes the NMS or CGI OMS, and LEC Server configurations, the updated LEC Server will connect to NMS or CGI OMS and to the SCADA or EMS. Once these connections are made, the system communicates data in real-time without further interaction from the LEC AIM application until new point information needs to be updated on one of the systems.

About LEC Asset ID Manager

LEC Asset ID Manager (AIM) interacts with a SCADA or EMS system, an LEC Server, and an NMS or CGI OMS system. The following sections explain how these different systems typically communicate and the steps the LEC AIM application takes to keep their configurations aligned.

LEC Asset ID Manager and LEC Server

LEC AIM creates LEC Server batch files based on available points configured on a SCADA or EMS system. LEC Server batch files are text files in a CSV format that describe the points on the remote system and their dataflow through the LEC Server. LEC AIM can also load batch files remotely into the LEC Server. A user can start, stop, and debug the generated LEC Server configuration using the LEC Configuration Manager (LCM) GUI application.

LEC Asset ID Manager and NMS or CGI OMS

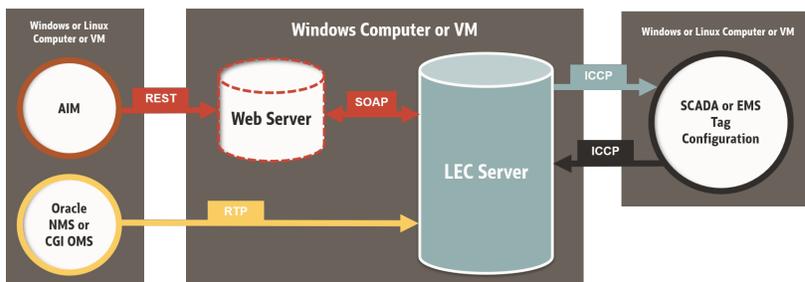
LEC AIM maps available points on SCADA (or EMS) to LEC Server to NMS (or CGI OMS) devices and device attributes.

LEC Asset ID Manager's Interaction with Other Systems

LEC AIM typically interacts with software systems on three different machines and uses various communications protocols:

- LEC AIM runs on the same machine on which the NMS (or CGI OMS) is installed.
- LEC Server runs on a separate Windows Server 2016 or 2019 machine.
- The SCADA (or EMS) runs on any number of additional separate machines depending on an organization's OT architecture.

Each customer's use of LEC AIM may vary depending on the architecture of their OT system and the configuration of their LEC Server. The figure below shows a typical relationship between these systems and the communication protocols used between them and the LEC AIM application.



Purpose of LEC Asset ID Manager

The purpose of LEC Asset ID Manager (AIM) is to:

- automate the creation of LEC Server batch files from points configured on a SCADA (or EMS) system.
- load the prepared batch files into an LEC Server instance.
- map NMS (or CGI OMS) devices and device attributes to points configured on a SCADA (or EMS) system.
- update the NMS (or CGI OMS) configurations.

This allows the NMS (or CGI OMS) system to receive real-time data from points on the SCADA (or EMS) system by way of the LEC Server.

Once all of the mapping between the SCADA (or EMS) system and the NMS (or CGI OMS) system is configured, the LEC Server transmits the real-time data to the NMS (or CGI's OMS) system typically using the LEC RTP protocol. In some customer configurations real-time data may be sent to and from the LEC server using other protocols and methods.

After an initial mapping, the LEC AIM application only needs to be run when either the SCADA (or EMS) or the NMS (or CGI OMS) configurations are updated or changed.

Customers have a choice to run the AIM application's processes manually through a command-line user interface or to automate the processes.

LEC AIM Processes and Functionality

Each customer's use of LEC AIM will vary depending on how their LEC servers are configured and their organization's OT infrastructure. For example, some customers may use NMS and some may use CGI OMS. Furthermore, some customers may not choose to use all available features of the LEC AIM application. The following outlines the steps in the LEC AIM process:

1. LEC AIM makes a request through REST for the point names and types available on the SCADA or EMS system. This request is processed by a web server (typically a Windows IIS web server running on the same machine as an LEC Server instance) and then sent to the LEC Server as a SOAP message.
2. LEC Server makes a request for all the point names available from the associated SCADA (or EMS) system.
3. The SCADA (or EMS) system responds to the LEC Server with the names and types of available points, and then the LEC Server:
 - generates a text file in CSV format from the point names and types.
 - sends a SOAP message to the web server that contains this text file.
4. The web server transmits this file to the LEC AIM application running on the NMS (or CGI OMS) machine.

5. LEC AIM processes this message with a report of available points on the SCADA (or EMS) system. It then gathers information about the Oracle NMS (or CGI OMS) configuration by directly querying the system's database or reading from a dump of relevant tables in CSV format.
6. LEC AIM processes all of this gathered information to map each point from SCADA (or EMS) to a known device and device attribute in NMS (or CGI OMS).
7. After processing this information, the LEC AIM will:
 - generate reports with information about changes on the SCADA (or EMS) system and information about any exceptions encountered during processing.
 - assign a unique RTP address to each mapped point and device attribute.
 - generate an LEC Server batch file with the point names and RTP addresses.
 - generate a SQL file that uses these RTP addresses, the device names, and the device attributes to update the staging configuration tables in NMS (or CGI OMS).
8. Then, if configured to do so, the LEC AIM application can:
 - load the LEC Server batch file into the remote LEC server, the LEC server running on the Windows machine).
 - load the mapping information into the NMS (or CGI OMS) staging configuration tables by running the previously generated SQL.
 - load the NMS (or CGI OMS) staging configuration tables into the production configuration tables.
 - direct NMS (or CGI OMS) to invoke the ICCP adapter to update their measurements and controls tables while preserving any existing quality codes or stored data values.
 - switch the LEC Server instance with the updated batch file loaded into an Active state so that it can establish an RTP association with the NMS (or CGI OMS) and an ICCP association with the SCADA (or EMS) system.

Note: The LEC Server's Real-Time Protocol (RTP) is developed by engineers that provide a simple TCP/IP interface for transmitting real time values. It is not related to the Real-time transport protocol used

to stream real-time audio and video data described in the IETF's RFC 3550.

Using LEC Asset ID Manager

This section focuses on starting the LEC AIM application's user interface, using the menu options, and running AIM commands. The AIM User Interface is a console application that accepts user input from the command prompt.

Starting the AIM Application

1. Open a command prompt.
2. Navigate to the location of the **runaim.sh** or **runaim.bat** file.
3. Run one of the following commands:

Linux: `./runAim.sh`

Windows: `runaim.bat`

Using the AIM User Interface

Once you launch the **menu.py** user interface, the program will display information about:

- The configuration file being used.
- The configured NMS instances (or CGI OMS instances).
- The configured Live Energy Connect machines.

Note: Any errors in connecting to these systems will be displayed as error messages written to the console.

The console will then display the available command options that you can use to run specific AIM commands. And finally, it will prompt you to enter a command. The following image is an example of how the LEC AIM user interface looks from a terminal in Linux.

```
[user@AimDemo]$ python aim/bin/menu.py --conf aim/organization/menu.conf
No Site Handler configured. Continuing with defaults.
-----> LiveData Asset ID Manager
-----
LiveData RTI Tag Manager (using /pathToAim/aim/organization/menu.conf)
-----
1 RTI Servers Configured:
  10.0.0.23:80:
  RTP: Waiting, Processor: Ready, SCADA: 1 Active of 1 Configured:
  AssocInControl = Active
-----
Enter 1 for Fetch the point names from RTI Server, then generate a batch file.
Enter 2 for Load the new batch file into active RTI Servers.
Enter 3 for Load the generated SQL file into the NMS measurements staging table.
Enter 4 for Execute the Recache utility to load the measurements from the staging table into
the NMS production table.
Enter 5 for Stop the ICCP adapter.
Enter 6 for Restart the ICCP adapter.
Press "N" for next command
Enter "help" for additional commands
Enter "x" to Exit
** Next command is: N/A <--
>>
```

Note: Different customers may have different command options available in the LEC AIM user interface depending on what is specified in their menu.conf file.

Setting Up LEC Asset ID Manager

Note: Before setting up an installation of LEC Asset ID Manager (AIM) customers should install and configure Live Energy Connect and Network Management System.

The LEC AIM application files are included with the Live Energy Connect installation materials available on Oracle eDelivery and the [My Oracle Support](#) portal (via the **Patches and Updates** tab). Although it is packaged with the LEC installer, the LEC AIM application is intended to be installed on the machine running NMS (or CGI OMS) not the machine running LEC.

Installation Steps

1. Enable and configure Internet Information Services (IIS) for Windows and ASP .NET 4.5 or higher on the machine running LEC Server. Refer to [Enabling and Configuring IIS and ASP .NET Framework 4.5 or Higher](#) for more details.
2. On the machine running NMS or CGI (OMS), extract the files in the **LiveEnergyConnectAIM7.1.x.x.x.zip** directory included with your download of the LEC product.
3. Move the LEC AIM application files to the directory from which you would like to run AIM.

4. Install the Python packages required for LEC AIM using Pip. The machine running LEC AIM should already have a version of Python 3 installed because NMS requires a Python 3 installation.

To use the LEC AIM application, you only need to install the additional Python packages that just the LEC AIM application uses. These packages have been provided as Pip wheel files in your download of LEC. They are located in the **LiveEnergyConnectAIM7.1.x.x.x/aim/packages/3x/** where 3x is the version of Python currently installed on your machine. The following list includes the required packages:

- six-1.15.0
- urllib3-1.25.10
- certifi-2020.6.20
- chardet-3.0.4
- idna-2.10
- numpy-1.19.2
- pandas-1.1.2
- python_dateutil-2.8.1
- pytz-2020.1
- requests-2.24.0

For information about the open source licensing of these packages, refer to the *Live Energy Connect Licensing Information User Manual*.

To install each package, use the following command where **<pathToWheelFile>** is the path to the .whl file included in the LEC AIM directory for the appropriate version of Python installed on your machine.

```
pip install <pathToWheelFile>
```

For example, to install the numpy package on a machine with Python 3.8 installed, you would use the following command:

```
pip install "C:\aim\packages\38\numpy-1.19.2-cp36-cp36manylinux1_x86_64.whl"
```

Launching the LEC AIM User Interface

1. LEC AIM files are deployed, you can launch the command-line user interface for the LEC AIM application by running the menu.py program with the Python interpreter, for example, `python.exe bin/menu.py --conf menu.conf`. This will start the console app's user interface with the default user menu. Most customers will have a site-specific menu.conf file prepared for them by engineers.
2. After configuring and testing their AIM application, most customers create a shell script (or a batch script if running on Windows) that can be used to start LEC AIM manually or automatically. If you set up a shell script to run LEC AIM automatically, you can schedule the execution of this script as a cron job (if running on a Linux machine) or as a scheduled task (if running on Windows). An example of such a script called runaim.sh is provided with your download of LEC AIM.

For example, if you'd like to run LEC AIM interactively and you are running LEC AIM with NMS on a Linux machine, the contents of this shell script would contain something like the following (depending on where you placed your LEC AIM files):

```
#!/bin/bash python aim/bin/menu.py --conf
/home/nmsadmin/aim/organization/menu.conf
```

If you'd like to run LEC AIM interactively and you are running Utilities LEC AIM with CGI PragmaLINE OMS on a Windows machine, the contents of your batch script would look something like the following:

```
@echo off
REM interactive mode
python.exe pathToAim\aim\menu.py --conf
pathToAim\aim\organization\menu.conf
```

If you'd like the shell script (Linux) or batch script (Windows) to run the LEC Asset ID Manager application automatically, use the `--auto` parameter. For example: `python.exe bin/menu.py --conf menu.conf --auto`

In the above example, the parameter `--conf` specifies your organization's

customized LEC AIM application's menu configuration file.

The parameter `--auto` indicates that you want to have the commands in the menu ran automatically.

Note: The interval at which LEC AIM can be run automatically is specified in the cron job table (Linux) or by the Task Scheduler (Windows). For more information, refer to Microsoft's Task Scheduler Help.

Enabling and Configuring IIS and ASP .NET Framework 4.5 or Higher

Note: Make sure to enable and configure Internet Information Services (IIS) and the ASP .NET Framework 4.5 or higher on Windows server.

IIS comes with Windows Server, but it is not installed or enabled by default. Installing and enabling IIS allows you to use your Windows machine as a web server. Clients, like LEC AIM, can then communicate with the Windows machine using HTTP or HTTPS.

After IIS is enabled, it needs to be configured. Use the following steps to enable IIS for .NET Framework 4.7. The menu text might look different if you are using another version of .NET Framework on your system.

Enabling Windows Internet Information Services (IIS)

If IIS is not enabled on your Windows machine follow these steps:

1. On Windows Server, open the **Server Manage** and select **Local Server**.
2. Select **Manage** and then select **Add Roles and Features**.
3. When the **Add Roles and Features** wizard opens, click the **Server Roles** tab and check the **Web Server (IIS)** box. The default values provide all the functionality LEC AIM needs.

4. Click the **Features** tab and check the **.NET Framework 4.x Features** box. The default values provide all the functionality LEC AIM needs.
5. Select **Next** and then select **Install**.
6. The status, *Windows completed the requested changes*, will display when IIS is successfully enabled.
7. Select **Manage** and then select **Add or Remove Features**.
8. Click **Next** until the **Server Roles** menu item is selected.
9. In the **Roles** list, navigate to the **Web Server (IIS)** and expand the sub-menu items.
10. Find **Web Server** and expand the **Application Development** sub-menu.
11. Select the latest version of ASP.NET. This will automatically select any necessary dependencies.
12. Click **Next** twice and then click **Install**.
13. After you see a successful installation message, restart the computer.
14. Open an internet browser to **http://localhost/** and you should see the default Windows IIS page.

Configuring IIS

1. Open the IIS Manager from the Windows **Start** menu.
2. Select the local machine in the **Connections** panel.
3. At the bottom of the IIS manager select **Content View**.
4. From the center panel, click **Sites**. You will see the **Default Web Site** icon.
5. Right-click the **Default Web Site** node to start it if it has not already started.
6. If a secure connection is required, set up Secure Sockets Layer (SSL). For more information, see Microsoft's [How to: Set Up Secure Sockets Layer \(SSL\)](#).

Running SetupAIMIIS.bat

To give LEC AIM users permissions to access all necessary LEC files (Python files and DLL files) through IIS, you must run the **SetupAIM.bat** script that is included with the installation package.

1. Open a **Command Prompt** as an administrator.
2. Navigate to `\Program Files\LiveEnergyConnect\AimIIS` and run `SetupAimIIS.bat` on Windows.

Note: If you use the **Set-ExecutionPolicy RemoteSigned** option when running this batch file, the web server will only run scripts that have been signed by a trusted publisher.

3. Review the output of the batch file to ensure all files are processed without error.

Configuring DCOM Permissions

Note: The Live Energy Connect product was formerly known as LiveData Utilities RTI Server. Certain files in the IIS configuration process contains references to LiveData.

Use the following steps to configure DCOM permissions for the `LiveData.config` file.

1. From the Windows **Start** menu, open **Component Services**.
2. In the **Component Services** dialog box, navigate to **Component Services**, **Computers, My Computer**, and then **DCOM Config**.
3. Right-click **LiveData.Config** and select **Properties** from the pop-up menu to display the **Properties** dialog box, and click the **Security** tab.
4. In the **Launch and Activation Permissions** section, click **Customize**.
5. Click **Edit** to display the **Launch and Activation Permission** dialog box.
6. Click **Add** to display the **Select Users or Groups** dialog box.
7. With the current machine selected in the **From this location** field, type `IIS AppPool\AimIIS` in the **Enter the object names to select** text box.
8. Select **Check Names** and click **OK** and confirm the AimIIS user was added to the list of users.
9. Select all check boxes under the **Allow** column to give the AimIIS user all permissions listed under **Permissions**, and click **OK**.
10. Give the AimIIS user full control over Access Permission.

11. Under **Access Permissions**, select **Customize** and click **Edit**.
12. In the **Access Permission** dialog box, repeat *steps 5* through *9* for Access Permissions.
13. Under **Configuration Permissions**, select **Customize** and click **Edit**.
14. In the **Configuration Permissions** dialog box, repeat *steps 5* through *9* for Configuration Permissions.

Note: You will not be able to select **Special permissions** under **Permissions for AimIIS** when you repeat step 8. However, the AimIIS user does not need special permissions.

15. Click **Apply**.
16. Click **OK**.

Verify AIM IIS Configuration is Working

You will need to verify the AIM IIS configuration is working using the following steps:

1. Ensure your LEC Server is running.
2. Make a request to the Aim IIS app to verify you can make a request to read a point on the LEC Server using the following format (text in **bold** font indicates values specific to your configuration):

```
http://  
AimServiceIpAddress  
:  
AimServicePort  
/AimIIS/AIMService.asmx/getPointValue?vmd=  
VmdName&port=LecSoapPort&point=PointLabel&apikey=  
AimServiceApiKey
```

For example:

```
http://localhost:80/AimIIS/AIMService.asmx/getPointValue?vmd=OMS_for_SCADA&port=8090&point=OMS_For_SCADA_AssocControl&apikey=LiveDataUserKey
```

This URL would request a read of the value for the point called **OMS_For_SCADA_AssocControl** in the VMD called **OMS_for_SCADA** on the LEC Server that is running on the local machine listening on SOAP port **8090** for requests from the **Aim IIS app**.

Note: If you get an internal server error from IIS when you make a request, check the security settings in the directory at **C:\Windows\Temp\gen_py**, and if necessary, manually add modify/read/write privileges for the **IIS AppPool\AimIIS** user in that directory. If you need or want to change the default value of the API key used by the AIM IIS app, you can modify the value of the API key used by specifying a different value of the "WebServiceKey=" parameter in the **svxnt.ini** file located in the **C:\ProgramData\LiveEnergyConnect** directory after a typical install.