



## **SMS 2.0 REST API Server Launch Kit**

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## The SMS 2.0 REST API and what it means to you

API is short for *Application Program Interface* and can best be defined as a set of routines, protocols, and tools for building software applications. An API specifies how software components should interact, either internally or externally with applications from different vendors. The Secure (https) SMS 2.0 REST API is available to 3<sup>rd</sup> party vendors that wish to interact with the SMS 2.0 Student Management or School Management (Combined Database) Suite. The 3<sup>rd</sup> party vendor works with Skyward to consume the API and integrate the API into their products.

The SMS 2.0 REST API has 2 endpoints, the **LMS API** endpoint and the **OneRoster API** endpoint. Note: The OneRoster API is new and was made available in the February Release Addendum 6 or newer.

The SMS 2.0 REST API endpoints are Read Only, unless you purchase the LMS/OneRoster API license. If the license is purchased both the OneRoster API and LMS API allow pass back of select Student Management Data.

If your district is Cloud Hosted, your hosting provider will perform the API Server Install. If your district uses Managed Services, IT Services will perform the API Server Install. Cloud Hosted and Managed Services customers should create an IT Services Service Call to request the API Install by calling 1-800-236-0001 or visiting the [Support Center](#).

## API Server Pre-Install Checklist

### **LMS API Minimum Version: 2016 June Release + Addendum 10**

- LMS API requires Skyward Version: 05.16.06.00.10 (or later)

### **OneRoster API Minimum Version: February Release + Addendum 6**

- OneRoster requires Skyward Version: 05.19.02.00.06 (or later)

### **System Requirements:**

- Windows 2008 / 2008 R2 / 2012 / 2012 R2 / 2016 / 2019 Server
- Windows 2008 / 2012 Requires Windows Service Pack 2
- .NET 4.6.1 or Newer
- 1GB of Free RAM, 200 MB of Free Disk Space on the Skyward Drive
- VMWare/Hyper-V Citrix XEN Virtual Servers are supported
- The Skyward API Server can be installed on any Skyward Web IIS Server with Progress OpenEdge already installed.
- Skyward API Server Install takes about 15 minutes to install
- Skyward API Server can be installed while users are in Skyward.
- Occasionally the .NET install will require a reboot before the API works.

### **API Server Components to be installed:**

- .NET 4.6.1
- IIS API Application
- API Config File Settings

## API Server Firewall Requirements

If your districts Skyward IIS Web Server(s) have a firewall between the Web Server and the database, please ensure the following ports are open. Districts may define custom ports when they were installed so all ports should be verified using the OpenEdge Explorer / Management tool.

### Default ports used by the API Server

- From Web Server(s) to Database Server → NameServer UDP Port 5162
- From Web Server(s) to Database Server → TCP Port for the Stateless AppServer
  - i. Student Management default → TCP 3095
  - ii. School Management (Combined Database) default → TCP 3099
  - iii. Student Management Training default → TCP 4001
  - iv. School Management Training (Combined Database) default → TCP 4005
- Both Directions Web Server(s) / Database Server -> TCP Port Range for the Stateless AppServer Default → TCP range 2002 – 2202

**Note:** The Stateless AppServer for Student Management is called asStuMon and for School Management (Combined Database) it is called asSkyMon. For Training systems, the Stateless AppServer for Student Management is called asStuMonTrn and for School Management (Combined Database) it is called asSkyMonTrn.

## Choosing a Skyward Server for the API Server

If you have one Skyward Student / School Management Server, then this is where the API Server will be installed. Verify the server meets the minimum requirements before installing the API Server.

The API Server Install typically takes about 15 minutes to install per Web Server.

The API Server can be installed while users are in Skyward. A reboot is suggested but not always necessary. In some situations, the server must be rebooted before the API will work correctly.

If you have multiple Skyward Servers, then you must install the API Server on every Skyward Student / School Management Web Server and you must complete the additional configuration to setup a Machine Key for load balanced servers.

## The API Server Install Summary

1. Ensure your software is at the June 2016 Release + Addendum 10 or later
2. Download the API Server Installer
3. Run the API Server Installer (~15 minutes)
4. Create a Key and Secret (~5 minutes)
5. If using multiple Load Balanced Web Servers configure the Machine Key
6. Test your API Server (~5 minutes)
7. If the API Server Test fails reboot the Web Server(s)
8. Provide the API URL, Key, and Secret to the 3rd party vendor.

## Download the API Server Installer file from the Secure FTP site.

1. Connect to our Secure FTP Instructions using the instructions found here: [Secure FTP Instructions](#)
2. Navigate to the Secure FTP folder of Hardware → Public → OE117-Customer-DVD → Windows
3. Download the file **11.7 - SMS 2.0 - Role - API Server Install.exe**.
4. Save the downloaded file to the ?:\skyward\install folder on the Skyward Web server
5. Continue to the API Server Installation instructions.

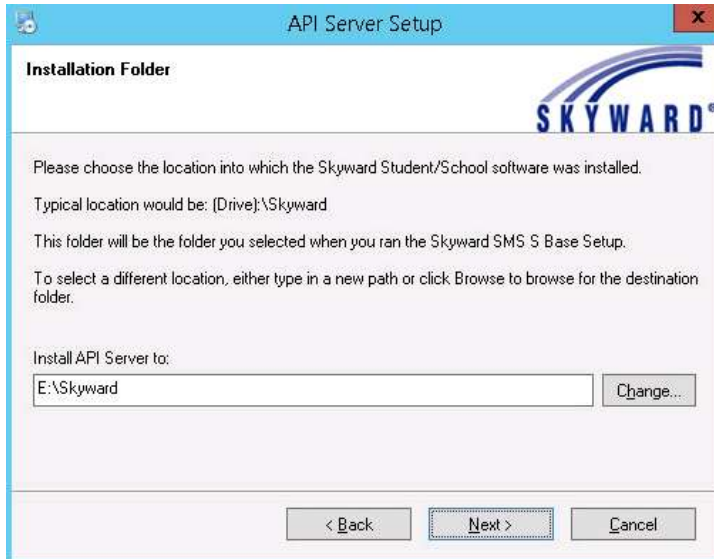
# API Server Install

## Notes:

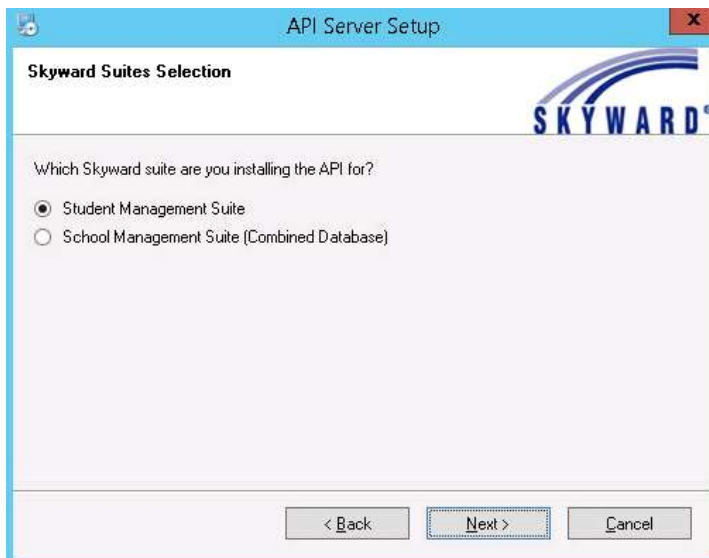
- The **11.7 - SMS 2.0 - Role - API Server Install.exe** needs to be installed on one Windows Skyward Student or School Management server that runs the IIS Web Server.
1. To start the **API Server**, install double click **11.7 - SMS 2.0 - Role - API Server Install.exe** file.
  2. The **Welcome** screen to **API Server Setup** will appear → Choose **Next**



3. The **Installation Folder** window will display → The Install will automatically detect the current OpenEdge Installation path. If the path is not correct change to the Drive and folder path where Skyward was installed → Choose **Next**.

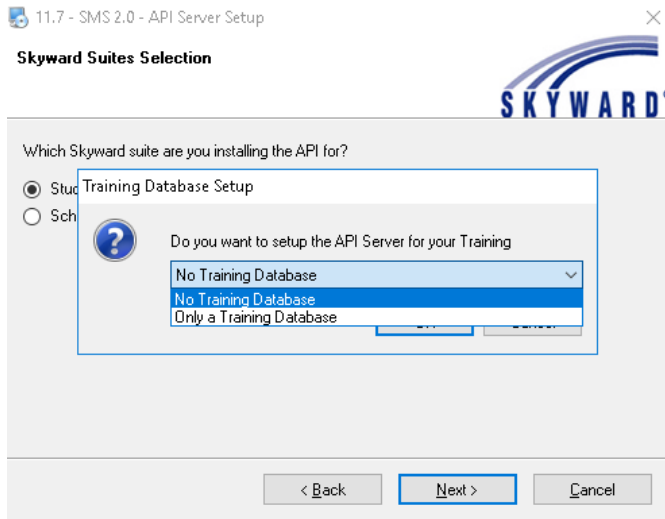


4. The **Skyward Suites Selection** window will display → Select your either the **Student Management** or **School Management Suite** (Student and Business Combined Database) → Choose **Next**.

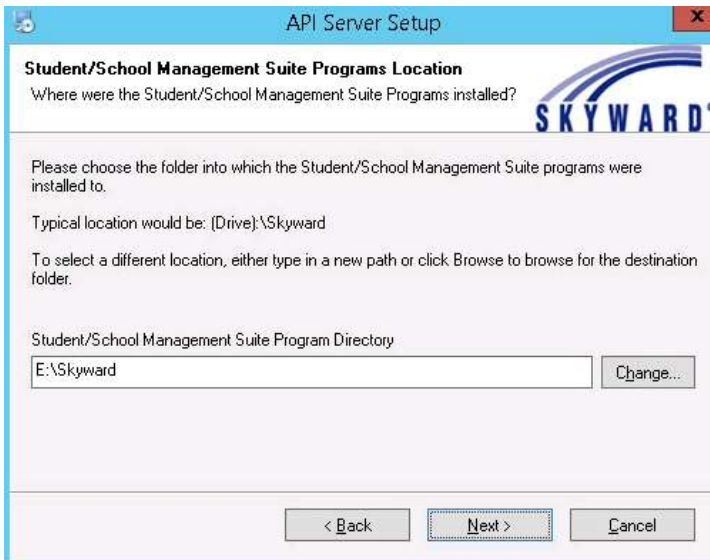




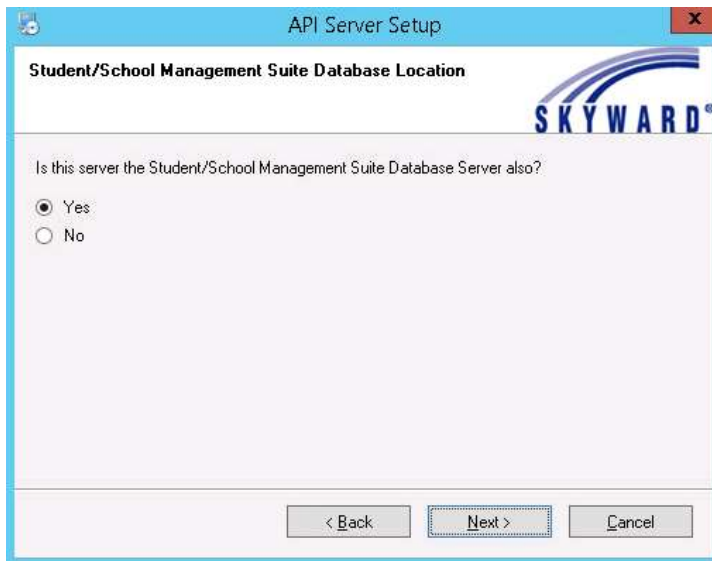
- The Training Database Setup window will display → Choose if you wish to setup the API Server for → No Training Database or Only a Training Database.



- If you chose to Install the API Server for your Live Database, the **Programs Location** window will display → Choose your Student Management or School Management program folder → Choose **Next**.



8. The **Database Location** window will display → Select **Yes** if this server is also your Student Management or School Management Database Server and proceed to step 9. Select **No** if this server is not your Database Server and proceed to step **8b**. → **Choose Next**.



8b. **No:** If you selected No → Enter the **IP Address** and **NameServer Port** of your Student Management or School Management Database → Choose **Next**.

**Note: The standard Student / School NameServer Port is 5162**

API Server Setup

Enter Student/School Management Suite Database IP and NameServer Port

SKYWARD®

Student/School Management Suite Database IP  
Enter Server Name or IP Address Here

Student/School Management Suite NameServer Port  
5162

Student/School Database IP Address and NameServer (NS1) Port can be found in the Progress Explorer Tool on the Student/School Database Server.

\*Note: There is no validation of these fields. If entered incorrectly the API will fail to start.

< Back   Next >   Cancel

9. If you chose to Install the API Server for a Training Database, the **Training Programs Location** window will display → Choose your Student Management or School Management **training programs folder** → Choose **Next**.

API Server Setup

Student/School Management Suite Training Programs Location

Where were the Student/School Management Suite Training Programs installed?

SKYWARD®

Please choose the folder into which the Student/School Management Suite Training programs were installed to.

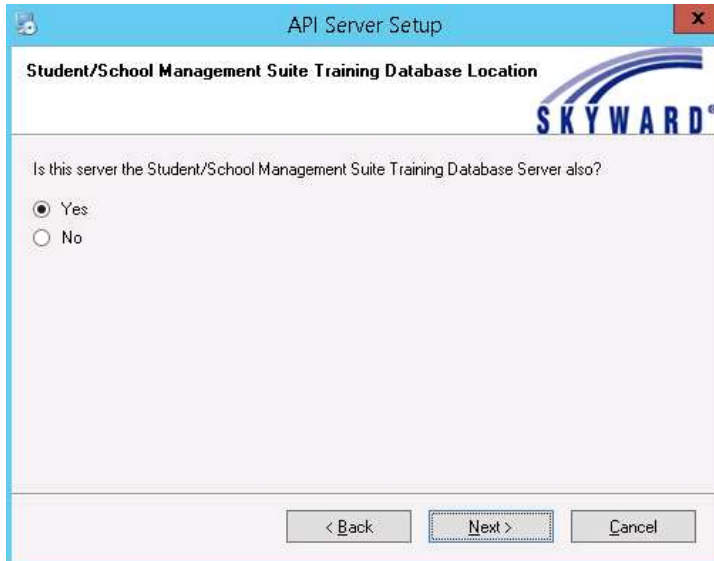
Typical location would be: (Drive):\Skyward\StuTrn or (Drive):\Skyward\SkyTrn

To select a different location, either type in a new path or click Browse to browse for the destination folder.

Student/School Management Suite Training Program Directory  
E:\skyward\SkyTrn   Change...

< Back   Next >   Cancel

10. The **Training Database Location** window will display → Select **Yes** if this server is also your Student Management or School Management Database Training Server and proceed to step 11. Select **No** if this server is not your Training Database Server and proceed to step **10b**. → **Choose Next**.



10b. **No:** If you selected No → Enter the **IP Address** and **NameServer Port** of your Student Management or School Management Training Database → Choose **Next**.

**Note:** The standard Training Student / School NameServer Port is 5162

API Server Setup

Enter Student/School Management Suite Training Database IP and NameServer Port

SKYWARD®

Student/School Management Suite Training Database IP  
Enter Training Server Name or IP Address Here

Student/School Management Suite Training Database NameServer Port  
5162

Student/School Training Database IP Address and NameServer (NS1) Port can be found in the Progress Explorer Tool on the Student/School Training Database Server.

\*Note: There is no validation of these fields. If entered incorrectly the API will fail to start.

< Back   Next >   Cancel

11. The **Ready to Install** windows displays → Choose **Next** to start the installation.

API Server Setup

Ready to Install

You are now ready to install API Server 20160928

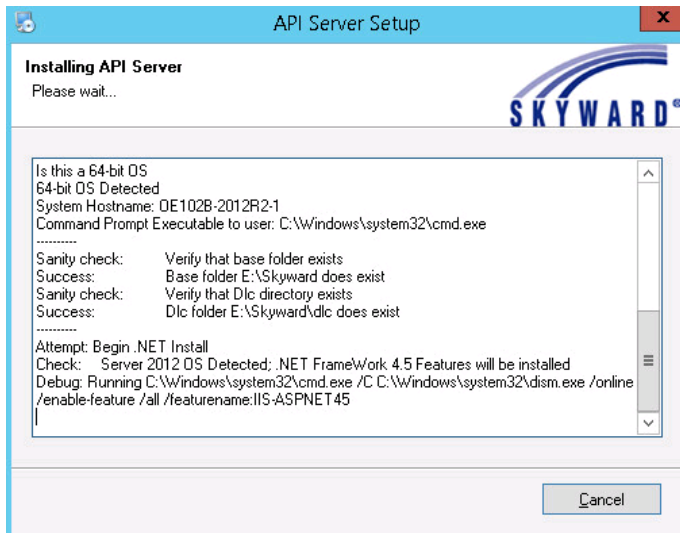
SKYWARD®

The installer now has enough information to install API Server on your computer.

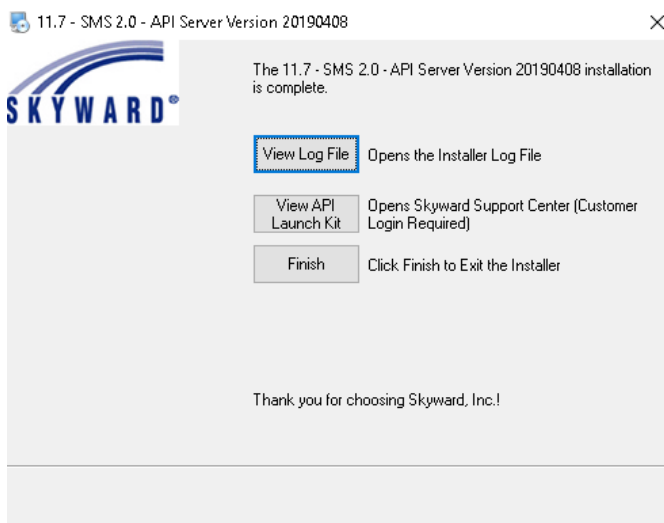
Please click Next to proceed with the installation.

< Back   Next >   Cancel

12. The **Installing API Server** window displays → The information that scrolls across the screen can be viewed in the installer log file.



13. The **Installation Complete** window displays → Choose the button to **View API Launch Kit** (this file), **View Installer Log**, or Choose **Finish** to exit the installer.



## Generating a Key and Secret

A Key and Secret will need to be created and given to 3<sup>rd</sup> parties that want to read data from the API Server. A Key and Secret is synonymous with a username and password. It is recommended that a unique Key and Secret be created for each 3<sup>rd</sup> party vendor that will be connecting the API Server.

1. Create a Secured User account within your database for each Organization that will connect to the API Server.
2. Browse to **Product Setup** → Skyward **Contact Access** → **Secured User** → Click Add → Click the **Organization** button → Enter **Organization (Vendor) Name** → Click **Add Entered name to Secure Users** → Enter **Address Info** and Save (optional) → Enter **Demographic Info** and Continue (optional) → Enter **Security Info** desired and Save →

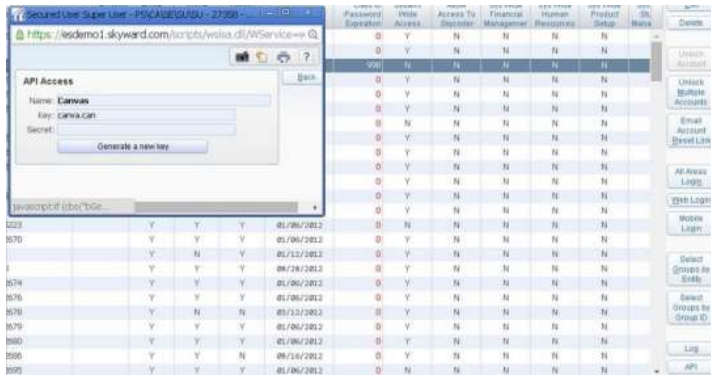
**Note:** The user must remain active, other settings can remain at the default.

The screenshot shows a web form titled "Security Information" for a user named "Canvas". The form is divided into three main sections:

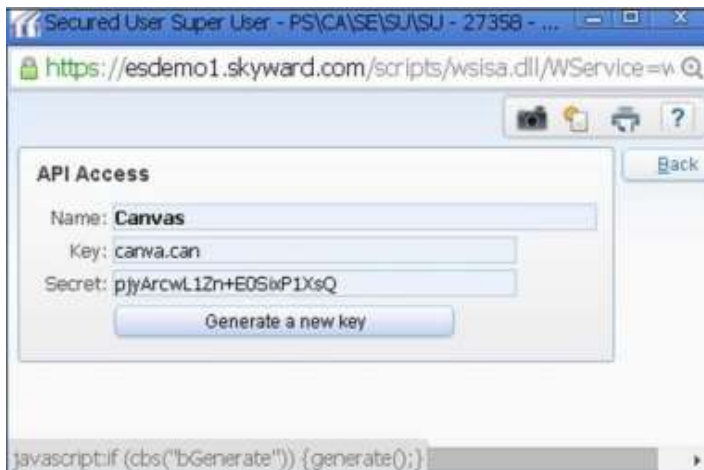
- Name:** Canvas
- Account Information:**
  - \* Login: CANVA
  - \* Password: CAP@\$\$WORD (with a "Generate" button)
  - Force password change at next login
  - Minimum Password Length: 8
- Secured User Settings:**
  - Active Secured User: Yes (dropdown)
  - System Wide Access: No (dropdown)
  - Allow User to Access Skycoder: No (dropdown)
  - Customer Access:**
    - Submit Service Calls: No (dropdown)
    - Submit User Group RFEs: No (dropdown)
    - Submit Billable RFEs: No (dropdown)
    - Customer Access ID: 0 (text input)
    - Send Email Notification: No (dropdown) with a help icon (?)

- Highlight the **New Organization User** in the Secured User list → Click the **API button** in the lower right corner of the screen → Click **Generate New key**

**Note:** If the API button is not available please make sure you are running the June 2016 Release + Addendum 10 or later.



- The Key and Secret displayed on the API access screen will be used by 3<sup>rd</sup> party vendors making the connection to the API Server.

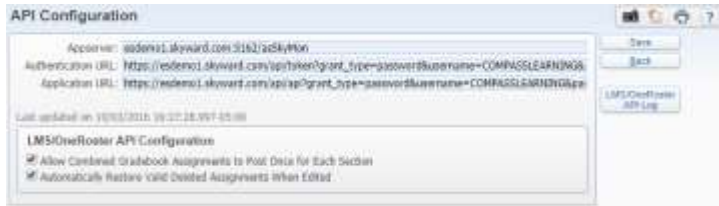


The API URL should be sent to your 3<sup>rd</sup> party vendor along with the Key and Secret from the previous steps. Your API URL is: <https://{DNSNAME}/api>



## API Configuration Options

The API Configuration Options and API Logging can be found by browsing to Product Setup → Contact Access → District Setup → Configuration → API Configuration.



## Test the LMS API Server using Swagger

1. From the any web browser → browse to the **Student/School URL** <https://{DNSNAME}/api/swagger/ui/index> → Enter a valid **Key** and **Secret** → Choose **Get Token** → Click on **District** → Choose **Get District Information** → Choose **Try it out!**

**Note:** Do not run this test from the Skyward Server using Internet Explorer.

**Note:** The swagger Try it Out! Test page button queries data from your Skyward database just like a 3<sup>rd</sup> party application would do. This test validates that your Key and Secret are correct, and that the API Server is working correctly.



2. A successful test will display data retrieved from your Skyward database like the “DistrictCode” or “DistrictName” in the Response Body like the example shown below.



```
Response Content Type: application/json *
Type: application/json
Curl
curl -X GET --header 'Accept: application/json' --header 'Authorization: Bearer s0m3r4ng0u3r0b4k0ndth3r3p0r4f4d1f4g-424e@dam
Request URL
https://example.skyward.com/api/v1/District
Response Body
{
  "DistrictCode": "11111",
  "DistrictName": "Hillman School District",
  "Development": "",
  "City": "",
  "State": "IA",
  "ZipCode": "",
  "WebSiteAddress": "",
  "Website": "http://www.hillman.com/"
}
```

3. To complete the integration send your API URL along with the Key and Secret you created from the previous steps to the 3<sup>rd</sup> party vendor. Your API URL is: <https://{DNSNAME}/api>

**Congratulations, your API Server Install is Complete!**

## LMS API Data Objects

The following list of Data Objects have been made available to 3<sup>rd</sup> party vendors that consume the LMS API. Documentation on the supported endpoints are found using the [Swagger Interface](#).

If the LMS/OneRoster API license is purchased the LMS API allows pass back for LMS API objects. If the license is not purchased the LMS API allows read only access to all data objects listed below.

### LMS API Version 1

- AbsenceReasons
- AbsenceTypes
- Assignments
- AssignmentScores
- Courses
- Departments
- District
- EmergencyContacts
- Enrollments
- Errors
- GradingCategories
- GradingCategoryCodes
- GradingPeriods
- Guardians
- Names
- Relationships
- Schools
- Sections
- Settings
- SpecialCodes
- StaffMembers
- StandardGrades
- Standards
- Students
- Subjects

## OneRoster API Data Objects

The following list of Data Objects have been made available to 3<sup>rd</sup> party vendors that consume the OneRoster API. Documentation on the supported endpoints are found on the [IMS Global](#) website.

If the LMS/OneRoster API license is purchased the OneRoster API allows pass back for Categories, LineItems (Assignments), and Results (Assignments Scores). If the license is not purchased the OneRoster API allows read only access to all data objects listed below.

### OneRoster API Version 1.1

- categories
- results
- lineitems
- academicssessions
- classes
- courses
- demographics
- enrollments
- gradingperiods
- orgs
- schools
- students
- teachers
- terms
- users

## Advanced Configuration Options

The advanced configuration options are not necessary for most customers and are intended for special configurations where multiple environments are hosted on a shared set of web servers, or when a customer has multiple load balanced web servers.

### Configuring Multiple API Instances on a Shared Web Server

The template configuration file [skyward]\ocx\skywardapi\appsettings.config.template has examples to define multiple running instances of the API on servers that are setup with multiple Skyward environments, like a Cloud Hosted server.

To run multiple API instances each instance of the API must have a set of unique keys defined for each environment. The IIS Virtual Application must match the name of the unique keys.

To configure multiple applications, copy the Multiple Applications appSettings section to the top of the appsettings.config.template file, overwriting the existing appSettings section, and then save the file as [skyward]\ocx\skywardapi\appsettings.config

```
<!--
*****
* Multiple Applications Example (Cloud Hosted) *
*****
-->
<appSettings>
  <add key="DistrictOneAPI_NSHost" value="myserver" />
  <add key="DistrictOneAPI_NSPort" value="5162" />
  <add key="DistrictOneAPI_ASName" value="asAppserverDistrictOne" />

  <add key="DistrictTwoAPI_NSHost" value="myserver" />
  <add key="DistrictTwoAPI_NSPort" value="5162" />
  <add key="DistrictTwoAPI_ASName" value="asAppserverDistrictTwo" />
</appSettings>
```

For Example , set the key values to “DistrictOneAPI” and then set the configuration values for this customer within this configuration section. Once that is done, set the key values for “DistrictTwoAPI” and set the configuration values for District Two. You can support as many instances of the API on any one IIS Web Server as you wish by adding additional keys and setting the values.

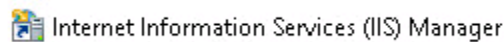
In IIS you must create an API Virtual Application for each configuration section, for the example above you would need an API Virtual Application named “DistrictOneAPI” and another named “DistrictTwoAPI”.

Your API URLs would be: <https://{DNSNAME}/DistrictOneAPI> and <https://{DNSNAME}/DistrictTwoAPI>

## Additional IIS Setup for Load Balanced API Servers

If your district has more than one web server that is load balanced, please follow these steps to setup the API for load balancing. The API Server must be installed on all Skyward Web Servers that participate in the load balancing of the Skyward Web Applications.

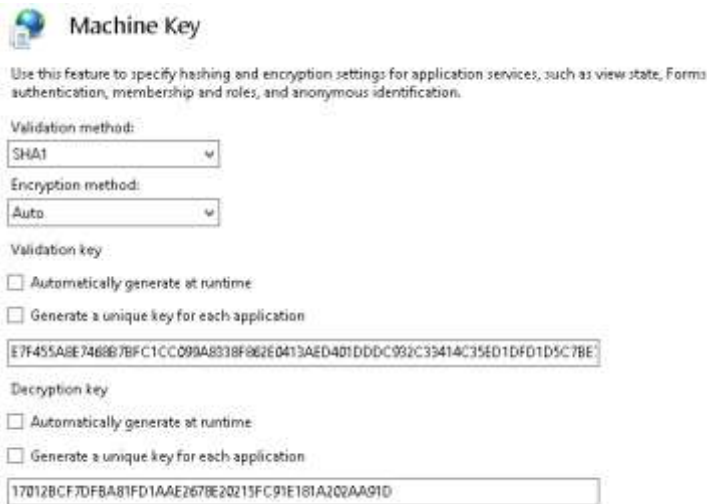
1. Select **one** of your **Skyward Web Servers** that has the **API Server** Installed. Open the **Administrative Tools** Control Panel → Open the **Internet Information Services (IIS) Manager**.



2. Expand the **IIS Server** → Expand **Sites** → Expand the **Skyward Web Site** → Select the **API Application** → Click on the **Machine Key** icon.



3. Under **Validation Key** → **Uncheck** the option to automatically **Generate at Run Time** → **Uncheck** the option to **Generate a Unique Key** for each application → Under **Decryption Key** → **Uncheck** the option to automatically **Generate at Run Time** → **Uncheck** the option to **Generate a Unique Key** for each application.



**Machine Key**

Use this feature to specify hashing and encryption settings for application services, such as view state, Forms authentication, membership and roles, and anonymous identification.

Validation method:  
SHA1

Encryption method:  
Auto

Validation key

Automatically generate at runtime

Generate a unique key for each application

E7F455ABE7468B7BFC1CC099A8338F8E2E0413AED401DDDC992C39414C35ED1DFD1D5C7BE

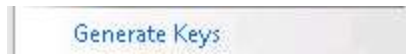
Decryption key

Automatically generate at runtime

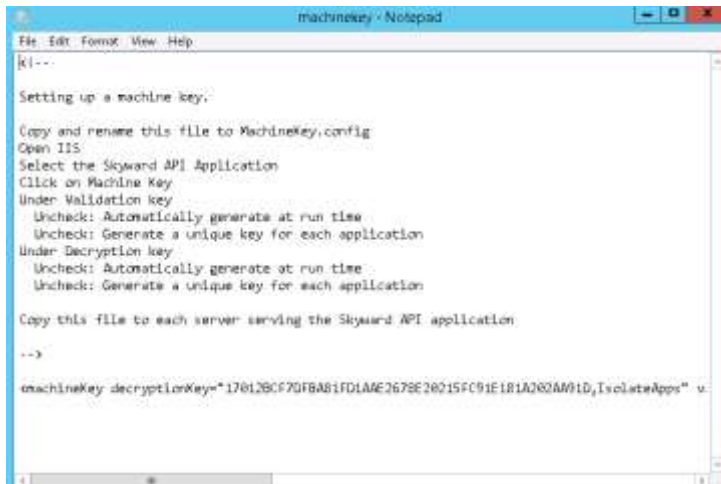
Generate a unique key for each application

17012BCF7DFBA81FD1AAE267BE20215FC91E181A202AA91D

4. On the right-hand side → Click **Generate Key** → Click **Apply**



5. Open the **{Skyward program path}\ocx\skywardapi\MachineKey.config** file using **Notepad** and you will notice it now has a **Machine Key** populated. → No changes are necessary → Close the file after verifying the Machine Key is populated.



```
File Edit Format View Help
KI--
Setting up a machine key.
Copy and rename this file to MachineKey.config
Open IIS
Select the Skyward API Application
Click on Machine Key
Under Validation key
  Unchecked: Automatically generate at run time
  Unchecked: Generate a unique key for each application
Under Decryption key
  Unchecked: Automatically generate at run time
  Unchecked: Generate a unique key for each application
Copy this file to each server serving the Skyward API application
-->
<machineKey decryptionKey='17612BCF7DFB81FD1AE2678E26215FC91E181A262AM91D,IsolateApps' u...
```

6. Copy the **MachineKey.config** file noted above to each **API Server {Skyward program path}\ocx\skywardapi\** folder that has the **API Server** installed.