



e-Builder API User Guide

v. 8.7

To get connected to e-Builder's oData API please contact your Account Manager. If you are not sure who your account manager is or how to reach them please contact e-Builder's support team at 888-288-5717



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Version History

Version	Date	Synopsis
1.0	5/05/14	Initial Release
1.1	9/17/14	Updated with additional data entities

1.0 Introducing e-Builder oData API

e-Builder now offers a way to seamlessly extract raw data from the system through the use of an oData API (Application Programming Interface). Although exports are available in different areas of e-Builder Enterprise™, the API allows you to garner more information with less navigation, and data remains accessible in real time. This data is often necessary to create custom reports, reconcile financial data in incumbent systems, and essentially can be used in an infinite number of ways to meet your business needs. As data is being extracted from e-Builder Enterprise, permission settings are honored with every API call to ensure team members are only accessing information they have access rights to.

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1.1 Why Use the API

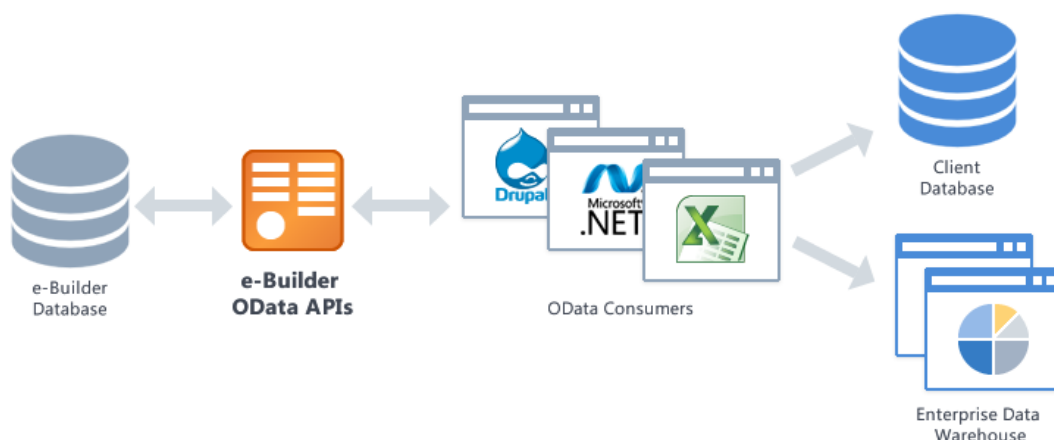
The API can be used to integrate data that resides in e-Builder with other software and databases to create customized solutions. For example:

- Produce executive dashboards with combined data from e-Builder and other internal systems
- Reconcile data in your financial systems with the data in e-Builder
- Leverage e-Builder data to make a case for custom solutions
- Create custom reports with combined e-Builder data

1.2 Understanding oData API

e-Builder's integrated web service APIs ensure seamless integration with other systems and facilitate real-time data exchanges. Our API is based on the Open Data Protocol (oData); an open protocol for sharing data and is also an industry-standard XML data exchange format. oData is a REST (Representational State Transfer) protocol; therefore a simple web browser can view the data exposed through an oData service.

Our API is an interface into e-Builder that allows other applications to make programmatic requests and access the objects and data without using the e-Builder user interface. This gives you the ability to connect or integrate multiple data sets and processes together to create a more customized solution. The flowchart below describes this exchange.



oData supports an array of frameworks, applications and plug-ins that allow you to make API calls from e-Builder Enterprise. These third-party tools are referred to by oData as *Consumers*. To obtain a full list of supported consumers, please visit <http://www.odata.org/ecosystem/> - Consumers tab.

1.2.1 Query String Options

The oData protocol has a standard programming language used for sorting and filtering data. For instance, all query options are prefixed by a "\$" character. A few examples include:

- \$orderby – allows you order by a specific field.
- \$filter – allows you to filter data
- \$skip – allow you to skip a subset of data, such as null values.

For more information or for a full list of query string options, please see the oData URI Conventions by going to <http://www.odata.org/documentation/odata-version-2-0/uri-conventions/> and scrolling down to Section 4: Query String Options.

1.2.2 Response Codes

When oData is queried, a response code is given. Below are the common responses:

- 200: The request has succeeded
- 400: Invalid request
- 401: Unauthorized: Access is denied due to invalid credentials
- 404: Resource not found for the segment you requested
- 429: Too Many Requests. Throttling limit has been exceeded
- 500: Server side error

1.3 Throttling and Paging


Throttling and paging have been applied to the e-Builder API. Understanding these concepts will optimize your use of the API. The sections that follow provide a brief overview of each concept.

1.3.1 Throttling

Throttling refers to the number of API calls allotted within a specified window of time. This is a common practice used among many software companies such as Adobe, Facebook, and Twitter, to name a few. This mechanism is used to prevent the degradation of system performance. By default, 15 API calls are allowed within a 15 minute interval. Each time a call is made to the database, you will receive a message in the response header that includes the total number of calls allowed (X-RATE-LIMIT-LIMIT), the number of calls that remain (X-RATE-LIMIT-REMAINING), and the time at which additional calls can be made (X-RATE-LIMIT-RESET).

 **Example:** oData Response Header

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml;charset=utf-8
X-RATE-LIMIT-LIMIT: 15
X-RATE-LIMIT-REMAINING: 11
X-RATE-LIMIT-RESET: 4/16/2014 10:44:20 AM
DataServiceVersion: 2.0;
Set-Cookie: ASP.NET_SessionId=t2prfcfm3c5i5g45urvxf55; path=/; secure; HttpOnly
X-FRAME-OPTIONS: SAMEORIGIN
Date: Wed, 16 Apr 2014 14:44:04 GMT
Content-Length: 1131228
```

 **Note:** Although we make this information available, whether or not it displays in its entirety will depend on the tool that is being used. Depending on the tool, there may or may not be settings available that allow you to see all the information available in these alerts.

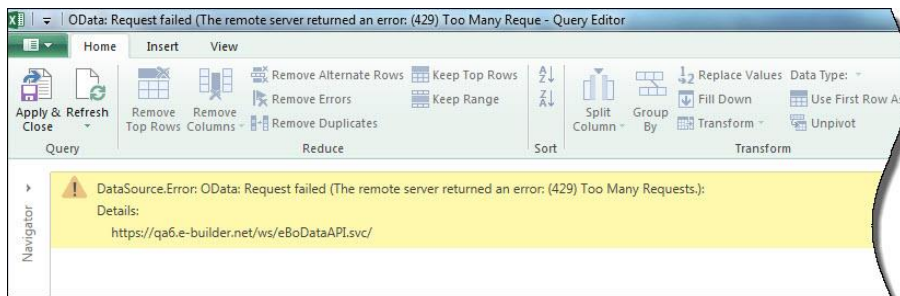




Figure 1: Sample Throttle Message in Microsoft® Excel® Power Query

The following actions constitute an API call:

 **Note:** Depending on the tool, data is initially rendered in a preview window. If the operations listed below are completed within this window and it requires a call to the e-Builder database, it is considered an API call.

i *Tip: It is typical in most API consumer applications to have an action similar to “Apply and Close” which will close the preview window and allow you to manipulate data in their native application, without requiring a call to the e-Builder database. If you’ve already accessed updated information, use this function to reduce the amount of API calls necessary and remain within the threshold.*

- Refreshing the page
- Viewing a new e-Builder object
- Filtering
- Sorting

 **Note:** *If you foresee a need to make more than 15 calls within a 15 minute window, please contact e-Builder Support by sending an email support@e-Builder.net or calling us toll free at 888-288-5717 (U.S.) or +1 954-556-6701 Option 7.*

1.3.2 Paging

The results of an API query may result in hundreds of pages of data. To optimize performance, the amount of data visible on a single page will be limited to a certain amount per page. Additional results will appear on subsequent pages.

Page limitations are based on the data type, as follows:

Data Type	Paging Limits
1. Bids	50
2. Bidders	50
3. Bid packages	50
4. Bid scope items	50
5. Budgets,	100
6. Budget line items & Cost Summary	100
7. Calendar events	50
8. Capital plans	50
9. Cash flow items (Current)	100
10. Commitments	100
11. Commitment line items	100
12. Commitment changes & items	100
13. Contacts	500
14. Document log by project	100
15. Forecast items (Current)	100
16. Form types and instances	100
17. Funding Sources	100
18. Funding Rules & Distribution	100
19. Invoices & Items	100
20. Planning scenarios	50
21. Processes & Instances	100
22. Process Line Items	100
23. Process routing history	100
24. Projects	100

25.	Project Issue Types & Issues	100
26.	Roles & Members	50
27.	Schedule & Tasks (Current)	50
28.	Submittal Packages	100
29.	Submittal Items	100
30.	Users	100

1.4 Supported e-Builder Entities

Below is a list of supported e-Builder data types. Note that all entities are written as a single word, which is the convention that should be followed when querying data.

- Budget Items
- Budgets
- Cash Flow
- Cash Flow Items
- Commitment Change Items
- Commitments
- Invoice Items
- Invoices
- Projects
- Users
- Budget Changes
- Budget Change Items
- Process Types
- Process Instances
- Process Line Items
- Forecast Items
- Forecast Item Details
- Forecast Item Adjustment
- Dynamic Cost Items

2.0 API Authentication

API authentication is a two-step process:

- Step 1: [Manage API Access Keys](#)
- Step 2: [Access the API Consumer](#)

2.1 Manage API Access Keys

API access can be granted by account administrators. API keys are unique 30 character passwords required for accessing e-Builder data from the API Consumer. Keys are specific to the assigned user and only one key can be generated per person. The following tasks will help you manage API access keys:


- [Create New API Keys](#)
- [Enable/Disable API Keys](#)

2.1.1 Create New API Keys

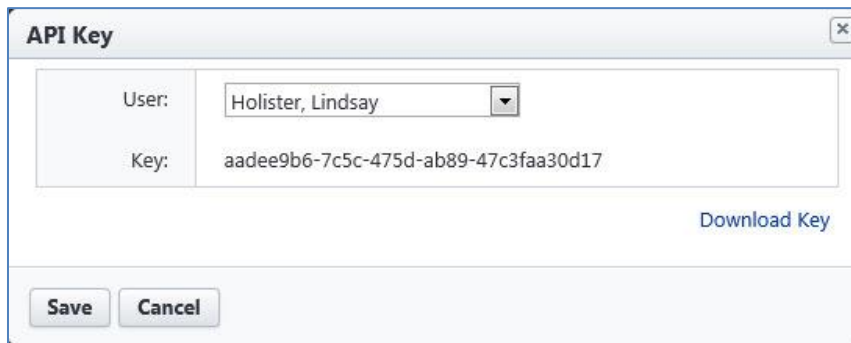
API keys can be created for yourself or other team members. Typically, the API will be used by personnel responsible for generating reports or IT professionals. This task supports the initial creation of an API key and generating a new key if the previous key was lost.

To create a new API key:

1. In e-Builder Enterprise, click the **Setup** tab from the Main Navigation Bar.

 **Note:** *If the Setup tab is not visible, click the Plus sign, and then click the **Setup** link.*

2. In the Administration Tools section, click **API Access**. The API Access page displays.
3. Click **Create Key**. The API Key pop-up window displays.



User:	Holister, Lindsay
Key:	aa4ee9b6-7c5c-475d-ab89-47c3faa30d17

[Download Key](#)


4. Click the **User** drop-down arrow to select the person to assign the key to.
5. To download a text file that includes the username and key, click **Download Key**.
6. Click **Save**.

2.1.2 Enable/Disable API Keys

API Keys can be disabled at any time, which will temporarily revoke the person's access to API data until their key is enabled again.

To enable or disable an API key:

1. In e-Builder Enterprise, click the **Setup** tab from the Main Navigation Bar.

 **Note:** If the Setup tab is not visible, click the Plus sign, and then click the **Setup** link.


2. In the Administration Tools section, click **API**. The API Access page displays.
3. To disable an API key, click the **Disable** link next to the person's name.

Or

To enable an API key, click the **Enable** link next to the person's name.

2.2 Access the API Consumer

The API can be used with an array of API consumers that may already be accessible to you. To obtain a full list of supported tools, please visit <http://www.odata.org/ecosystem/> - Consumers tab.


 **Note:** See [Appendix A](#) for a .NET Code Snippet (page 12)

2.2.1 Prerequisites

After you've opened the API Consumer, you will need the following sets of information to make an API call.

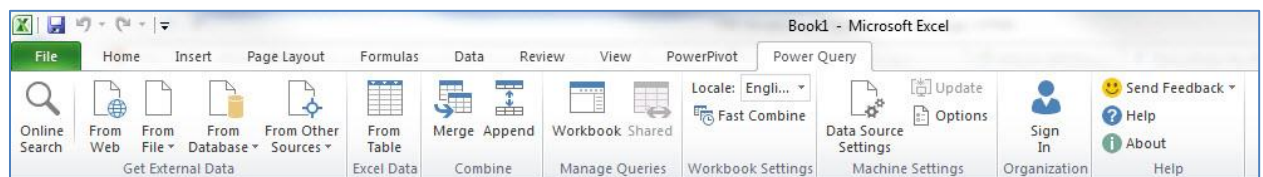
- URL: <https://API.e-builder.net/eBoDataAPI.svc/>
- e-Builder username
- API Access Key

2.2.2 Sample API Call Using Microsoft® Excel® Power Query

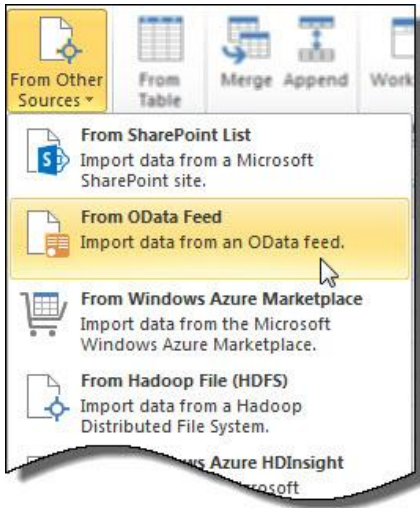
 **Example:** The example that follows uses the Microsoft Excel Power Query plug-in; however an array of applications, frameworks and plug-ins can be used. To obtain a full list of supported API Consumers, please visit <http://www.odata.org/ecosystem/> - Consumers tab. For instructions on connecting with other API Consumers, please see the tool's native help documentation.

To set up an API connection using Power Query:

1. [Download Power Query](#).
2. From the Microsoft Excel ribbon, click the **Power Query** tab.




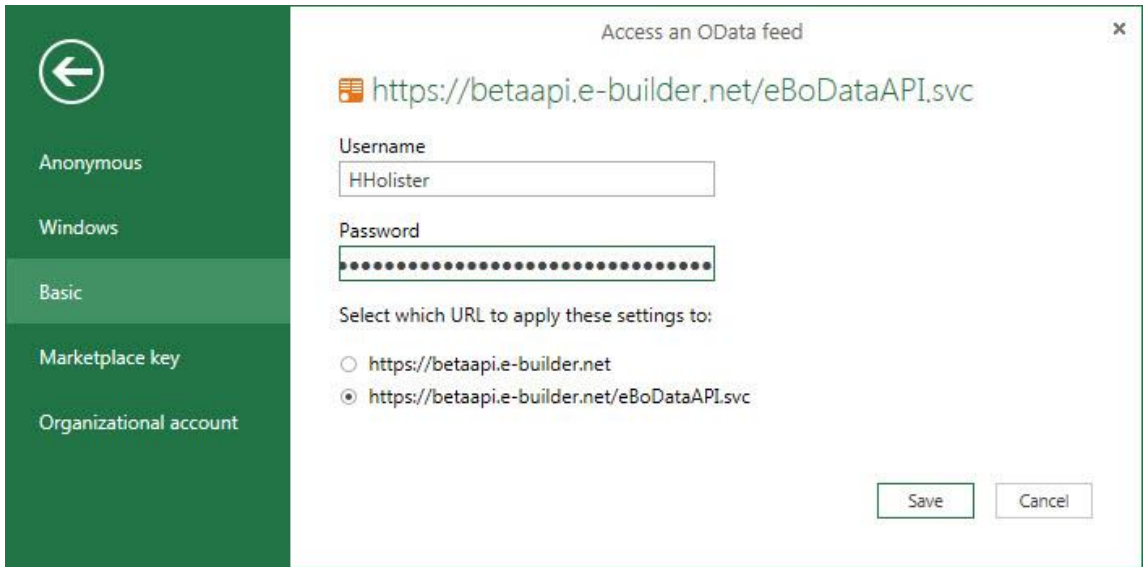
3. Click the **From Other Sources** drop-down arrow and select **From oData Feed**.



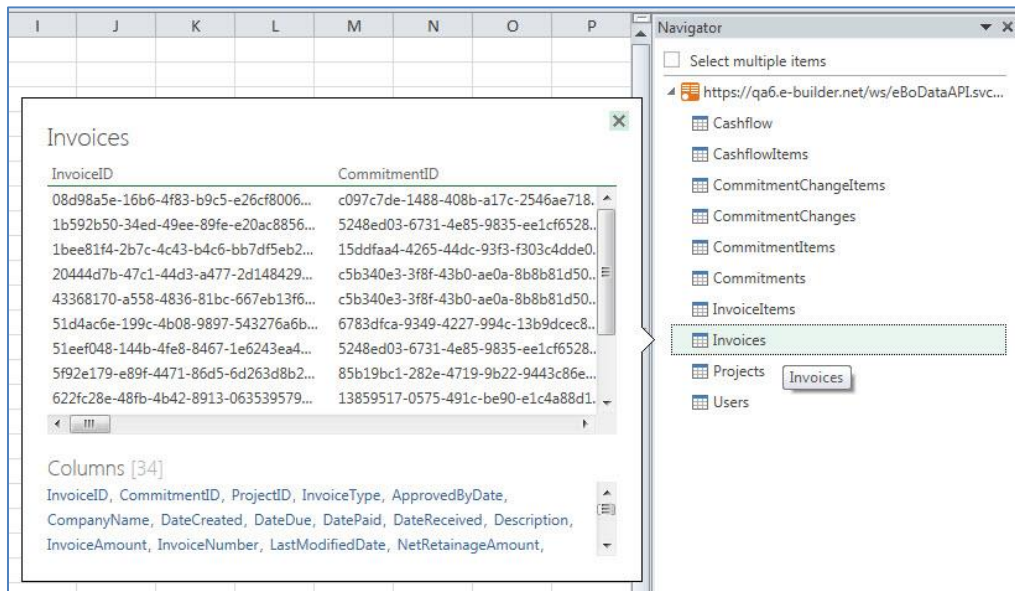
The OData Feed pop-up window displays.



4. In the **URL** field, enter **API.e-builder.net/eBoDataAPI.svc/**
 **Note:** To access a specific cost entity, include it at the end of the URL. For example, to query Invoices, enter the URL as follows: <https://api.e-builder.net/eBoDataAPI.svc/Invoices>. If an entity is not specified, a list of all available entities will display. For a complete list and their conventions, see [Supported e-Builder Entities](#) (page 6).
5. Click **OK**. The Access an oData feed window displays.
6. From the Left Navigation pane, click **Basic**.



7. Enter your e-Builder username and API access key.
8. Select the second radio button option, <https://api.e-builder.net/eBoDataAPI.svc>
9. Click **Save**. The Power Query spreadsheet displays.
10. From the **Navigator**, located on the right-side of the page, double-click an object to display its contents.



The output file displays in a preview window.

Invoices - Query Editor

Home Insert View

Apply & Refresh Remove Top Rows Remove Columns Remove Errors Remove Duplicates Reduce Sort Split Column Group By Fill Down Replace Values Data Type: Text Merge Append Queries Queries Combine Help

InvoiceID	CommitmentID	ProjectID	InvoiceType	ApprovalByDate	CompanyName	DateCreated	DateDue	DatePaid
1 08f98a5e-16b6-4f83-b5c5-e26c7800621d	c097c7de-1488-408b-a17c-2546ae718c05	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/14/2012 12:00:00 AM	Flora's Tech Crew	8/14/2012 6:46:28 PM	null	
2 1b592b50-34e4-49ee-89fe-620ac8586bd2	5248ae03-6731-4e85-9835-ee1cf652807d	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	3/12/2012 12:00:00 AM	Flora's Tech Crew	3/12/2012 2:31:03 PM	null	
3 1bee114-2b7c-4c43-b4c6-b07d5eb285d	15d8fae4-4265-44d1-93f3-f303c4d8e0ea	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	3/15/2012 12:00:00 AM	South East Contractors	3/15/2012 6:55:13 PM	null	
4 2044447b-47c1-44d3-a477-2d14842955db	c5b340e3-3f8f-4300-ae0a-8bb881d500a1	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	3/13/2012 12:00:00 AM	Clody's Construction Depot	10/18/2011 5:57:36 PM	null	
5 43386170-a558-4836-81bc-667eb1396476	c5b340e3-3f8f-4300-ae0a-8bb881d500a1	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	12/2/2011 12:00:00 AM	Clody's Construction Depot	12/2/2011 8:22:55 PM	null	
6 51d4ac5e-199c-4b08-8897-543276a6b061	6783dfca-9349-4227-994c-13b9dacc88af	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/6/2012 12:00:00 AM	SCC Soft Computer	8/6/2012 9:02:34 PM	null	
7 51eef048-144b-4fe8-8467-1e6243ea40b6	5248ae03-6731-4e85-9835-ee1cf652807d	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/6/2012 12:00:00 AM	Flora's Tech Crew	8/6/2012 8:22:47 PM	null	
8 592e179-e89f-4471-86d5-622638b219d1	85e139c1-282e-4719-9b22-9443c86a2897	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	null	SCC Soft Computer	10/18/2011 5:15:58 PM	null	
9 622f238e-487b-4b42-8913-063553957901	13859517-0575-491c-be90-e1c4a88d179c	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/6/2012 12:00:00 AM	Clody's Construction Depot	8/6/2012 9:08:53 PM	null	
10 67b6138a-5fbb-4b14-bd64-c7702025497e	73a09c41-edf6-45af-95f7-10d313aa8be6	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/1/2013 12:00:00 AM	Flora's Tech Crew	8/1/2013 8:52:17 PM	8/1/2013 12:00:00 AM	
11 a189595a-4904-4854-9065-24fb96981d2	6783dfca-9349-4227-994c-13b9dacc88af	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	8/6/2012 12:00:00 AM	SCC Soft Computer	8/6/2012 9:01:01 PM	null	
12 cf:86705-adf1-4e50-867b-6d6148bb1a3c	eb21b361-7f59-4aa2-9882-460e3ba08fe6	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	3/15/2012 12:00:00 AM	Clody's Construction Depot	3/15/2012 5:44:19 PM	null	
13 ea702a85-b2e4-438a-9646-93ee0b22850	c5b340e3-3f8f-4300-ae0a-8bb881d500a1	fad36634-1140-4200-8bbf-447c22b28bc7	CommitmentInvoice	3/13/2012 12:00:00 AM	Clody's Construction Depot	10/18/2011 5:56:51 PM	null	8/19/2012 12:00:00 AM

Query Settings

PROPERTIES

Name: Invoices

Description:

APPLIED STEPS

Source

LOAD SETTINGS

Load to worksheet

Tip: To view the data in the main Excel spreadsheet, click **Apply and Close**. This will allow you edit the content and also refrain from making additional API calls.

Appendix A: .NET Code Snippet

Below is a .NET code snippet that can be used to make an API call directly from an internal system. For example, e-Builder data can be queried for use in a financial system using the below snippet; simply replace <<username>> and <<apikey>> with the actual values.

```
Dim uri As System.Uri = New System.Uri("https://api.e-builder.net/eBoDataAPI.svc")

Dim ctx As eBoData.eboDataService = New eBoData.eboDataService(uri)

Dim credCache As New System.Net.CredentialCache

Dim cred As New System.Net.NetworkCredential("<<username>>", "<<apikey>>")

credCache.Add(uri, "Basic", cred)

ctx.Credentials = credCache
```

As an example, I am retrieving the first project from the list of projects. Any query can be written on the projects collection here.

```
Dim project As eBoData.Project = ctx.Projects.FirstOrDefault()
```