

BISTECH VERDA

HTTP-Rest API Integration Manual

HTTP Rest v1.11



**BORSA
İSTANBUL**

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Document History

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v0.1	09.06.2015	Initial Version	Information Management App. Dev.
v1.0	15.06.2015	Updated list of file types accessible via the API	Information Management App. Dev.
	17.06.2015	Test system web address changed	Information Management App. Dev.
v1.01	26.06.2015	Added Change-password service End-point.	Information Management App. Dev.
v1.02	06.08.2015	File Type List Updated	Information Management App. Dev.
v1.03	27.08.2015	lastGenerated & expectedGenerationTime added to File Type List End-Point.	Information Management App. Dev.
v1.04	31.08.2016	Support contact info is updated. VERDA API Quick Connection Test Guide is added.	Information Management App. Dev.
v1.05	16.02.2017	BISTECH Phase-2 File Type Definitions are added.	Information Management App. Dev.
v1.06	22.04.2020	File Type Definitions are added.	Information Management App. Dev.
v1.07	13.07.2020	Verda Rest Api file list address is updated.	Information Management App. Dev.
v1.08	20.07.2020	TRY based BIST Stock Indices and Customer Indices were divided by 100 as of 27th July 2020 (including this date). Annotaion has been added	Information Management App. Dev.
v1.09	15.04.2021	Website URL is updated	Information Management App. Dev.
v1.10	14.10.2022	Int3 test environment details are added to VERDA API and Connect Access Point tables.	Information Management App. Dev.
V1.11	05.05.2023	Update, Verda connection method	Information Management App. Dev.

I.Overview

VERDA (**VERi Dağıtım**, Data Dissemination in Turkish) is data distribution platform that allows Borsa İstanbul customers (such as Member Firms, Data Vendors, Index Licensors) to access data in several formats related to services they receive.

VERDA HTTP- Rest API, on the other hand, is intended for customers who wish to programmatically integrate to the VERDA system in order to be able to automatically download files they are authorized to access. Customers could list the file types they have access to, search and download instances of these file types using criteria such as date and session depending on the file frequency. VERDA HTTP- Rest API will be referred to as API for the rest of the document.

Examples provided in this document will use **wget** command line tool and list HTTP headers that are included in a typical request and response

II.How to access the API

In order to access to the Verda system via API, API user creation must be requested by contacting the BIST Service Desk. API Access and API User Creation Procedure are detailed below.

a. API ACCESS

Production and test environments for API are listed below. Test environment is intended for customers to use for testing while they are developing integration software.

Customers need to request separate API users from BIST Service Desk for each environment.

All members can access the test environments through the internet or the members who have VPN connections with Borsa İstanbul can access the VERDA API environment through BORSA VPN connections. The members who want to access via VERDA API via BORSA VPN connection must add the statement to the HOSTS file which are shown in the table below.

VERDA API Access Points

Environment	Access	Verda API Access Point	The statement for HOSTS File
Prod	Internet	https://verda.borsaistanbul.com/	
Int2	Internet	https://verdaint2.borsaistanbul.com/	
	VPN	http://verda.int2.uyg.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address
Int	VPN	http://verda.int.uyg.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address
Int3	Internet	http://verdaint3.borsaistanbul.com/	
	VPN	http://verdaint3.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address
UAT	Internet	https://verdauat.borsaistanbul.com/	

Connect Access Points

Environment		Connect Access Point	The statement for HOSTS File
Prod	Internet	https://connect.borsaistanbul.com/	
Int2	Internet	https://connectint2.borsaistanbul.com/	
	VPN	http://connect.int2.uyg.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address

Int	VPN	http://connect.int.uyg.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address
Int3	Internet	http://connectint3.borsaistanbul.com/	
	VPN	http://connectint3.borsaistanbul.com/	You can obtain it by sending an email to bistechsupport_autoticket@borsaistanbul.com address
UAT	Internet	https://connectuat.borsaistanbul.com/	

b. API USER CREATION PROCEDURE

i. Production environment

Before an API user could be created for a customer firm, an “individual account” user needs to be created for them that can access the CONNECT platform. In order to request access to CONNECT, users need to fill out “BISTECH Connect User Creation Agreement” and submit a signed copy to Borsa Istanbul. The form could be found at (<https://www.borsaistanbul.com/en/sayfa/2998/connectverda>). Upon receiving the filled out and signed form, Borsa Istanbul will create a “super user” for the firm, to access CONNECT. Using this account, firms can access VERDA module and manage their API users once it is created by Borsa Istanbul.

In order to have an API user created for them, firms must contact Borsa External Service Desk and request that an API user be created for them. Following the firm’s request, an API user will be created for the firm and firm’s super user will be notified via email so that they could edit API user details on CONNECT platform.

The initial password created by BIST Service Desk and emailed to the super user is inactive and blocked. In order for the firm to be able to use the API user, the super user must log on to CONNECT and reset API user’s password using the “User Management” module. Also change password service end-point could be used for password reset. API user will be activated once the password is reset, and the customer could start using the API.

ii. Test environment

Access to API test environment does not require a CONNECT user. An API user could be requested directly by sending an email to bistechsupport_autoticket@borsaistanbul.com

III.How to use the API

a. AUTHENTICATION

Every request made to API goes through authentication, therefore every request must include authentication information. API uses **HTTP Basic Authentication** method for authentication. Possible HTTP error messages and possible reasons are listed below:

i. Possible authentication errors

1. **401 Unauthorized:** Incorrect username or password
2. **401 Unauthorized:** User is blocked
3. **401 Unauthorized:** User is inactive
4. **403 Forbidden:** User could log on to CONNECT but is not authorized to use the API

ii. Example: Request with authentication credentials

Making a request to API with username U2345API and password 123456

Example

HTTP request must include **Authorization** header whose value equals Base64 encoded value of "username:password", which is "U2345API:123456".

```
> wget --user="U2354API" --password="123456" "https://verda.borsaistanbul.com/files" --auth-no-challenge -qSO -
```

HTTP Request

```
GET /files HTTP/1.1
Host: verda.borsaistanbul.com
Authorization: Basic dTIzNDVhcGk6MTIzNDU2
Cache-Control: no-cache
```

b. PASSWORD CHANGE

Using password change endpoint, user can change its VERDA API password.

Endpoint	https://verda.borsaistanbul.com/change-password	
HTTP Method	POST	
Required Headers	Authorization (see: AUTHENTICATION)	
Parameters	newPassword	Required. New password filed.
	oldPassword	Required. Existing(old) password filed.
Response Type	Response codes and message.	
Response	200 - Password change successful	
Error Messages	400 - New password must be different than the old password. It must be at least 8 characters and contain at least one upper case, one lower case character and a digit	

i. Example: Change Password Request

Example

```
>wget http://verda.borsaistanbul.com/change-password/ --user="U22623API" --  
password="U22623API" -- post-data='{"oldPassword":"U22623API", "newPassword":"Aa1234567"}'  
--header=Content-Type:application/json --auth-no-challenge -qS0-
```

HTTP Request

```
POST /change-password HTTP/1.1  
Host: verda.borsaistanbul.com  
Authorization: Basic dTIyNjIzYXBpOkFhMTIzNDU2  
Cache-Control: no-cache
```

HTTP Response

```
HTTP/1.1 200 OK  
X-Request-Id: b830eebb-918e-4460-b424-5aec80b8fe9e  
Content-Type: application/json  
Date: Fri, 26 Jun 2015 08:58:44 GMT  
Connection: keep-alive  
Transfer-Encoding: chunked  
Proxy-Connection: keep-alive  
Password change successful
```

c. LISTING FILE TYPES

Using file type listing endpoint, user can list the file types their firm is authorized to download via the API. The response will also include links for downloading the latest file or an archived file by providing search criteria.

Endpoint	https://verda.borsaistanbul.com/files	
HTTP Method	GET	
Required Headers	Authorization (see: AUTHENTICATION)	
Parameters	-	
Response Type	List of file types	
Response	Fields	
	id	File type ID
	name-tr	File type description (Turkish)
	name-en	File type description (English)
	frequency	Generation frequency (Yearly, Monthly, Daily, Every Session, Incremental, Hourly)
	expectedGenerationTime	<p>Gives the estimated (expected) generation time of the file type for today. File will be generated after a short time from the expected generation time. It gives the time in accordance with the trading day, if today is a full or partial trading day. If today is not a trading day it just returns "null".</p> <p>It works only for "Daily" generated file types, for the other file types it returns "null".</p> <p>Data format: hh:mm:ss +TimeZone Example: "17:45:00 +0300"</p>
	json	Indicates whether the file type could also serve in json format. (true/false)
	lastGenerated	<p>Gives the date-time information of the last generated File in the system.</p> <p>Example: "16-06-2015 17:45:28"</p>
	lastGeneratedFilename	<p>File name of the last generated file in the system.</p> <p>Example : "CB_20150616.csv"</p>

	links	<p>Download links</p> <ul style="list-style-type: none"> • Download Latest File: Link that could be followed in order to download the latest instance of this file type generated in the system. • Download with date/session criteria: This is a sample link that includes sample values for search criteria suitable for the file type's period • JSON Content: If the data could be served in json format, this link is included to display how to request data in json format
Error Messages	(see: Possible authentication errors)	

Example: Listing file types

Example

Listing file types

```
>wget --user="U22623API" --password="qweqwe" "https://verda.borsaistanbul.com/files" --
auth-no-challenge -qSO -
```

HTTP Request

```
GET /files HTTP/1.1
Host: verda.borsaistanbul.com
Authorization: Basic dTIyNjIzYXBpOkFhMTIzNDU2
Cache-Control: no-cache
```

HTTP Response

```
Access-Control-Allow-Methods → GET, HEAD, POST
Connection → keep-alive
Content-Encoding → gzip
Content-Type → application/json
Date → Thu, 11 Jun 2015 17:11:28 GMT
Server → borsa
Transfer-Encoding → chunked
[
  {
    "id": 57,
    "name": "Tüm emirler",
    "frequency": "Daily",
    "expectedGenerationTime": "17:45:00 +0300",
    "json": false,
    "lastGenerated": "10-06-2015 17:45:28",
    "lastGeneratedFilename": "TED_20150610.csv",
    "links": [
      {
        "description": "Download Latest file",
        "href": "files/download?type=57"
      },
      {
        "description": "Download Latest File with Date/Session Criteria",
        "href": "files/download?type=57&year=2015&month=6&day=11"
      }
    ]
  },
  {
    "id": 102,
    "name": "Toplam İşlem Hacmi, İşlem Miktarı ve Sözleşme Sayısı",
    "frequency": "Daily",
    "expectedGenerationTime": "17:45:00 +0300",
    "json": false,
    "lastGenerated": "10-06-2015 17:46:48",
    "lastGeneratedFilename": "TIS_20150610.csv",
    "links": [
      {
        "description": "Download Latest file",
        "href": "files/download?type=102"
      },
      {
        "description": "Download Latest File with Date/Session Criteria",
        "href": "files/download?type=102&year=2015&month=6&day=11"
      }
    ]
  },
  {
    "id": 103,
    "name": "Üye Bazında Seanslık İşlem Sıralaması",
    "frequency": "Each Session",
    "expectedGenerationTime": "17:45:00 +0300",
    "json": false,
    "lastGenerated": "10-06-2015 17:45:38",
    "lastGeneratedFilename": "UI_20150610.zip",
    "links": [
      {
        "description": "Download Latest file",
        "href": "files/download?type=103"
      },
      {
        "description": "Download Latest File with Date/Session Criteria",
        "href": "files/download?type=103&year=2015&month=6&day=11&session=1"
      }
    ]
  },
  . . . . .
]
```

d. DOWNLOADING FILES

Endpoint	https://verda.borsaistanbul.com/files/download	
HTTP Method	GET	
Required Headers	Authorization (see: AUTHENTICATION)	
Parameters	type	Required. File type id
	year	Optional. Year the file is generated
	month	Optional. Month the file is generated
	day	Optional. Day the file is generated
	hour	Optional. Hour the file is generated
	session	Optional. Session the file is generated
	media	Optional (could only be json)
Response Type	File content, File content in JSON, or error messages	
Response	1- File content (text or binary, depending on the file type) 2- File content in JSON format	
Error Messages	<ul style="list-style-type: none"> • Authentication errors (see: Possible authentication errors) • 403 Forbidden: Invalid file type or the firm is not authorized for this file type • 403 Forbidden: Requested file type cannot be downloaded via the API • 404 Not Found: No instance of the file type could be found for given date/session criteria • 415 Unsupported Media Type: File content cannot be served in JSON format. Must remove media parameter • 500 Internal Server Error: Internal error, must contact BIST and provide X-Request-Id header's value or errorId if available 	

i. Example: Downloading “Lease Certificate Indices” file type as a file.

Downloading “Lease Certificate Indices” file type as a file.

Example

```
>wget --user="U22623API" --password="qweqwe"  
"https://verda.borsaistanbul.com/files/download?type=204" --auth-no-challenge --content-  
disposition -qS
```

HTTP Request

```
GET /files/download?type=204 HTTP/1.1  
Host: verda.borsaistanbul.com  
Authorization: Basic dTIyNjIzYXBpOkFhMTIzNDU2  
Cache-Control: no-cache
```

HTTP Response

```
Access-Control-Allow-Methods → GET, HEAD, POST  
Connection → keep-alive  
Content-Encoding → gzip Content-Type  
→ multipart/form-data Date → Thu, 11  
Jun 2015 17:25:06 GMT Server → borsa
```

```
Transfer-Encoding → chunked  
X-Request-Id → 45ff606a-6fcd-40f4-8642-38b8d91c6899  
content-disposition → attachment; filename=lease_certificates_indices.csv  
vary → Accept-Encoding
```

Note: lease_certificates_indices.csv file is downloaded

ii. Example: Requesting “Lease Certificate Indices” data in JSON format

Requesting “Lease Certificate Indices” data in JSON format

Example

```
>wget --user="U22623API" --password="qweqwe"
```

```
"https://verda.borsaistanbul.com/files/download?type=57&media=json" --auth-no-challenge --content-disposition -qSO -
```

HTTP Request

```
GET /files/download?type=204&media=json HTTP/1.1
Host: verda.dev.uyg.borsaistanbul.com
Authorization: Basic dTIyNjIzYXBpOkFhMTIzNDU2
Cache-Control: no-cache
```

HTTP Response

```
Access-Control-Allow-Methods → GET, HEAD, POST
Connection → keep-alive
Content-Encoding → gzip
Content-Type → application/json
Date → Thu, 11 Jun 2015 17:30:12 GMT
Server → borsa
Transfer-Encoding → chunked
X-Request-Id → 95dbba27-c747-4bb0-bddc-9e90c2e70ecf
vary → Accept-Encoding
```

```
[
  {
    "Date": "28/06/2013",
    "GovernmentLeaseCertificates": "100.0",
    "CorporateLeaseCertificates": "100.0"
  },
  {
    "Date": "01/07/2013",
    "GovernmentLeaseCertificates": "99.95025",
    "CorporateLeaseCertificates": "100.06017"
  },
  {
    "Date": "02/07/2013",
    "GovernmentLeaseCertificates": "100.14951",
    "CorporateLeaseCertificates": "100.08023"
  }
]...
```

IV.How to Receive Support

Please contact BIST for any questions or support requests using:

- VERDA Support : bistechsupport_autoticket@borsaistanbul.com
BIST External Service Desk: +90.212.298.24.27 #1

In case you encounter an error, please report it to bistechsupport_autoticket@borsaistanbul.com by providing information about the error using the format below. It is crucial that you provide X-Request-Id or errorId which will help us diagnose the issue a lot faster.

Issue Report Format;

Endpoint	https://verda.borsaistanbul.com/files/download?type=57
HTTP Method	GET
Date/time	05.06.2015 – 14:33
Username	U22623API
Error message (if applicable)	<pre>{ "code": "ForbiddenError", "message": "User does not have access to specified file type, or requested file type is available only on BISTConnect", "errorId": "1f125048-d001-47d3-89c8-e0703651bb1f" }</pre>
Value of X-Request-Id header	X-Request-Id → 561ee879-10ee-4090-acb5-4d00d6c96aa0

V.List of File Types Served on VERDA API

Only the file types that firms would need a programmatic integration for are listed on VERDA API.

List of file types available on the API are listed <https://www.borsaistanbul.com/files/verda-http-rest-api-file-descriptions.xlsx> address. Firms could download instances of the ones that they have authorization for.

VI.VERDA API Quick Connection Test Guidelines

Here below you can find steps, how to easily connect to VERDA API and test your VERDA API Connection.

- 1- First of all, you must apply Borsa İstanbul for CONNECT Super User. You must have a CONNECT Super User already.
- 2- You must apply Borsa İstanbul for VERDA API User. Borsa İstanbul must already have created a VERDA API user for your company.
- 3- You must reset and change your VERDA API User Password. In order to do this, CONNECT Super User must log in to connect.borsaistanbul.com and using “User Management Menu” -> “API and Application Users” -> “Change Password” button, new password can be set. To set new password, a temporary password must be entered to this menu. This temporary password will be sent to CONNECT Super User via e-mail when VERDA API user is defined by Borsa İstanbul.

NOTE: If you think that you did not get this e-mail with temporary password. Please also check Spam Box or Junk Box of your e-mail box.

- 4- In order to test your VERDA API User and connection. Download latest version of Google Chrome Web Browser to your PC with an internet connection.
- 5- Download and run POSTMAN Extension for Google Chrome from Google Chrome Web Store.
- 6- In the picture below , you can see how to test your connection and user , using POSTMAN extension :

Step 1 – Press Authorization Menu.

Step 2 – Choose “Basic Auth” for Authorization type.

Step 3 – Enter your VERDA API User name which is provided to you, after your application to Borsa İstanbul.

Step 4 – Enter your VERDA API password which you have reset entering connect.borsaistanbul.com User management menu.

Step 5 – Press “Update Request” button.

Step 6 – Make sure that “Get” protocol is chosen.

Step 7 – Please write the URL about which function of VERDA API you want to reach:

- i. <https://verda.borsaistanbul.com/files>: Using this function of VERDA API, you can access list of file types which you are permitted to download for your company.

- ii. <https://verda.borsaistanbul.com/files/download?type=XXX> : Using this function of VERDA API, setting XXX field with file type id, you can download the latest file within this file type.
- iii. <https://verda.borsaistanbul.com/files/download?type=XXX&year=YYYY&month=MM&day=DD> : Using this function of VERDA API , you can download a file with the given file type XXX , with the given date DD.MM.YYYY

Step 8 – Press “Send” button to make a query to VERDA API.

NOTE: Some file types in VERDA may be in zip format. This must be considered by software developers during VERDA API integration.

NOTE: When you make a query with URL <https://verda.borsaistanbul.com/files>. Information about each file types will be returned. You must check “expectedGenerationTime” field of a file type to understand approximate file upload time to VERDA system. So you can arrange your systems to download each type of file with a specific time during day. This will prevent you to make continuous queries to VERDA API and overload our systems.

NOTE: In order to get a username and password for VERDA API Test environments, please contact us from bistechsupport_autoticket@borsaistanbul.com

NOTE: In order to get a username and password for CONNECT Test environments, please contact us from bistechsupport_autoticket@borsaistanbul.com. CONNECT User’s password cannot be reset by our customers in CONNECT Test environments.

NOTE: TRY based BIST Stock Indices and Customer Indices were divided by 100 as of 27th July 2020 (including this date). When using the data files before 27th July 2020, TRY based BIST Stock Indices and Customer Indices values should be used by dividing by 100 and the divisors should be used by multiplying by 100. In addition, some changes were made in index futures and options contracts traded on VIOP (Derivatives Market) due to the division of the indices by 100. This situation should be considered when using the VIOP files before 27th July 2020. Borsa İstanbul does not have any responsibility for the aforementioned issues.

