Internal Bilateral Transactions (IBT)

Web Services Data Exchange Specification

Version 1.0
2015

ISO New England Inc.

Change Summary

Revision	Date	Comments
Version 1.0	July 2015	Initial release

About this document

The Internal Bilateral Transactions (IBT) Web Services Data Exchange Specification document describes the REST messages and the Authentication and Authorization process used to exchange contract data between a Market Participant and IBT through the web services. This document explains how to access the IBT web services, lays out the format and construction of REST messages used to exchange data, and briefly describes the Authentication and Authorization methods used to ensure security.

This guide is designed to assist Market Participants develop personal interfaces that interact and exchange contract data with the IBT web services. It will help Market Participants comprehend and construct the contract data messages essential for data exchange with IBT.

Scope and prerequisite knowledge

This document is offered to ISO New England Market Participants as an aid in developing new interfaces as well as assisting in the upgrade/re-design of existing interfaces. Users should be familiar with Extensible Markup Language (XML), Web Services, HTTP/HTTPS protocols, and ISO New England's governing documents, business rules and operating procedures. Refer to References and Additional Information for helpful links.

Structure of this document

- Section 1 gives an overview of the IBT web services including IBT web service design and access, IBT roles, and authentication and authorization.
- Section 2 describes REST operations and their construction.
- Section 3 explains the functionality of the REST operations available for exchanging contract data between a Market Participant and IBT.

References and Additional Information

All of the data exchanges using the IBT web services are described by types defined in the IBT XSD file:

- **vnd.iso-ne.contract.customers.v1.xsd**

Additional information about Extensible Markup Language (XML), Web Services, and other helpful information can be found at the following web locations:

- XML –
    - o **http://www.w3.org** > XML Technology
    - o **http://www.w3schools.com** > Learn XML
- Web Services –
    - o **http://www.w3.org** > Web Service Technology
    - o **http://www.w3schools.com** > Learn Web Services
- REST –
    - o **http://www.packetizer.com/ws/rest.html**

ISO New England governing documents include the Transmission, Markets & Services Tariff, ISO New England Manuals and Operating Procedures. They can be found at the following location:

- **http://www.iso-ne.com/participate/rules-procedures**

Table of Contents

1. Web Service Overview

This section gives an overview of web service concepts associated with the IBT web services, how to access the IBT web services, and the appropriate IBT roles.

1.1 Web Service Design

The IBT web services (the IBT application's programmatic interface) are organized as a tree of HTTP resources with different URL patterns for different types of resources. Each type of HTTP resource is considered a separate "web service" in section 3 below. The different resource types support specific operations from the standard HTTP methods (GET, POST, etc.) and have their own message structures for transferring contract data between a Market Participant and the IBT application through the interaction of the Market Participant's client interface and IBT's web services. The web service messages use XML format for data transmission, which is discussed in more detail in chapter 2 entitled REST Messages.

All web service requests follow the request/response pattern supported by HTTP(S) communication. A request may contain a message that modifies (or submits) data identified in the URL or it may query for data identified in the URL. The response is a message that is either: 1) the new state of the data following a modification, 2) an error, or 3) the current state of the data for a query.

Any resource that allows data to be modified will support a GET operation that allows for that data to be queried. These resources have a modifying operation (POST e.g.) and a GET operation that return the same data. Some resources simply have GET operations, and they are used for the sole purpose of requesting specific data from the IBT application.

1.2 Accessing the IBT Web Services

The IBT web services are based on REST over HTTPS (version 1.1). A client application that accesses IBT can be written in nearly any modern enterprise technology and language, such as Java, .NET, C++, Ruby, etc. The web service is accessible to authorized Participants through an ISO New England published URL, and all posts/puts of data and queries are serviced via the same URL.

Access to IBT web services is managed through the Customer and Asset Management System (CAMS).

Your company's Security Administrator (SA) is responsible for assigning roles per your company's internal procedures and controls.

The SA is also responsible for issuing digital certificates to users, as required (e.g., a customer may already have a digital certificate if they already have access to another ISO SMD application).

For details on managing access, SAs can refer to the "CAMS User Guide for Digital Certificates" which is available by contacting ISO-NE Customer Support.

1.3 IBT Roles

Roles restrict the web service operations/messages available to a given user to submit or query data. Currently there is a single role for all Market Participant users of the IBT application, and all Market Participant users of the IBT application have uniform access to the IBT web services. All operations defined for every type of resource below are accessible to any Market Participant user of the IBT application. Use of a web service operation by a user without the role allowing access to the IBT application will result in an error (see error handling in Section 2.1).

2. REST Messages

This section describes constructing REST messages, restrictions on data submitted, and REST format/documentation.

REST is an architecture style for exchanging information involving Web Services such as those provided by the IBT application. IBT REST messages are constructed using Extensible Markup Language (XML) as a structure to store data. This XML message body carries descriptions of the data for interpretation by an interface or Web Service.

Each HTTP message body used by the IBT application has a common *media type*:
- application/vnd.iso-ne.contract.customers.v1+xml;charset=UTF-8

The XML data in each HTTP message body has a common *XML Schema*:
- *Namespace* http://xmlns.iso-ne.com/contract/customers
- *Schema XSD file* vnd.iso-ne.contract.customers.v1.xsd

2.1 REST Operations Responses

Each message sent to IBT is an "all or nothing" event. IBT will use database transactions, such that a commit will only occur on successful processing of an entire REST operation. If an exception occurs while processing a request, a response will be sent to the user with the appropriate HTTP response status code, and the transaction will be rolled back.

The client error 4XX response status codes are used to indicate errors requiring correction on the client side, along with a standard text/plain HTTP response body, e.g:
- 404 Not Found for requests whose URLs do not name a supported resource.
- 405 Method Not Allowed for requests using an operation unsupported for the resource, e.g. a POST for a GET-only resource.
- 415 Unsupported Media Type for requests (e.g. POSTs) specifying a media type besides the one listed above for the IBT application.
- 400 Bad Request for requests whose message body is not valid XML data of the expected XML type.

2.2 Format and Construction

Each REST HTTP request supported by the IBT application has a common base URL:
- https://smd.iso-ne.com/sms_oper_contract/api/customers

Different types of resources (the web services listed below) are named by URL patterns, where an individual resource has a specific URL that applies specific values to the pattern, e.g.:

https://smd.iso-ne.com/sms_oper_contract/api/customers/1/subaccounts
https://smd.iso-ne.com/sms_oper_contract/api/customers/1/contractSubaccountMappings/9999

Clients are encouraged to use **Accept** request headers with a version-specific media type to support future API versioning. While these URLs can produce the generic application/xml media type (Accept: application/xml), the version-specific media types above are recommended (e.g., Accept: application/vnd.iso-ne.contract.customers.v1+xml;charset=UTF-8).

3. Web Services

This section explains the functionality of the REST operations available for exchanging contract data between a Market Participant and IBT.

3.1 Customer's Subaccounts

3.1.1 Purpose of Message

Returns a collection of Subaccounts belonging to the Market Participant indicated by the *customerId* parameter. Each Subaccount includes a sequence of versions with data currently effective for different periods.

3.1.2 REST Endpoint

https://smd.iso-ne.com/sms_oper_contract/api
/customers/{customerId}/subaccounts

3.1.3 Request Method

HTTP GET

3.1.4 Mandatory and Optional Fields

Parameters:
- *customerId* – Market Participant's unique numeric ID at ISO New England.

3.1.5 Sample Request

The Market Participant with numeric ID 1 may request:

GET https://smd.iso-ne.com/sms_oper_contract/api/customers/1/subaccounts

3.1.6 Data Returned

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<subaccounts xmlns="http://xmlns.iso-ne.com/contract/customers">
 <subaccount>
 <subaccount_id>ABC1</subaccount_id>
 <subaccount_version>
  <begin>2013-05-01T04:00:00Z</begin>
  <subaccount_name>ABC1 activity</subaccount_name>
  <subaccount_status>Active</subaccount_status>
 </subaccount_version>
 </subaccount>
 <subaccount>
 <subaccount_id>Default</subaccount_id>
```

```
 <subaccount_version>
  <begin>2013-05-01T04:00:00Z</begin>
  <subaccount_name>Default</subaccount_name>
  <subaccount_status>Active</subaccount_status>
 </subaccount_version>
 </subaccount>
</subaccounts>
```

3.2 Customer's Contract Subaccount Mappings

3.2.1 Purpose of Message

Returns or updates a collection of Contract Subaccount Mappings belonging to the Market Participant indicated by the *customerId* parameter.

3.2.2 REST Endpoint

https://smd.iso-ne.com/sms_oper_contract/api
/customers/{customerId}/contractSubaccountMappings

3.2.3 Request Method

GET returns a collection of Contract Subaccount Mappings belonging to the Market Participant indicated by the *customerId* parameter. Collection contains one Contract Subaccount Mapping for each contract the Market Participant is a party to. Contract Subaccount Mapping includes a sequence of versions with the data currently effective for different mapping periods during the contract.

POST creates new current versions for each Contract Subaccount Mapping in the request, so that the current versions have the requested subaccount for each mapping period.

3.2.4 Mandatory and Optional Fields

Parameters – all methods:

- *customerId* – Market Participant's unique numeric ID at ISO New England.

Parameters – GET optional query parameters:

Parameter name	Data Type; Format	Comments
page, *start*, and *limit*	Number	Subset of Market Participant's records (Contract Subaccount Mapping versions) to retrieve, based on total matching other query parameters. limit must be >=1 and <=1000 and defaults to 25 records. start must be >=0 and defaults to 0 (first page of records).
contract_id	Number	Return mappings for a specific contract ID number or contract ID numbers matching digits with * or % wildcard. Must be 1-9 characters.

reference_id	String	Return mappings for contracts with a specific reference ID or matching reference ID text with * or % wildcard. Must be 0-25 characters (blank is allowed).
subaccount_id	String	Return mapping versions with a specific subaccount ID or matching subaccount ID text with * or % wildcard. Must be 1-100 characters.
subaccount_name	String	Return mapping versions with a subaccount having a specific subaccount name or matching subaccount name text with * or % wildcard. Must be 1-100 characters.
category	String	Return mappings for contracts with a specific category: - ENERGY DAY AHEAD - ENERGY REAL TIME - LOAD REAL TIME - FCM LOAD OBLIGATION
location_id	Number	Return mappings for contracts with a specific location ID number.
party_id	Number	Return mappings for contracts with this party customer ID number.
start_date	Date ; mm/dd/yyyy	Return mapping versions overlapping this Eastern Time mm/dd/yyyy date, or the interval until end_date if end_date is specified.
end_date	Date ; mm/dd/yyyy	Return mapping versions overlapping this Eastern Time mm/dd/yyyy date, or the interval since start_date if start_date is specified.

Data – POST request body XML elements:

Optional	Element	Data Type; Format	Comments
No	customer_id	xs:nonNegativeInteger	Must be Market Participant's unique numeric ID at ISO New England.
No	contract_id	xs:nonNegativeInteger	ISO New England-specified contract unique numeric ID for a Contract Subaccount Mapping being changed.
No	market_name	xs:string	Contract's market name "Energy DA" etc. from market_name in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	buyer_name	xs:string	Contract's party name from buyer_name in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	seller_name	xs:string	Contract's party name from seller_name in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	contract_begin	xs:dateTime in GMT ("Z")	Contract's period begin date/time from contract_begin in GET. POST

			should repeat this element, though it will not affect any data in the IBT application.
No	contract_end	xs:dateTime in GMT ("Z")	Contract's period end date/time from contract_end in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	status	xs:string	Contract's status ("New", "Conf", etc.) from status in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	begin	xs:dateTime in GMT ("Z")	Mapping period begin date/time for an individual version of the Contract Subaccount Mapping. The contract's period is divided into mapping periods.
Yes	end	xs:dateTime in GMT ("Z")	Mapping period end date/time for an individual version of the Contract Subaccount Mapping. The contract's period is divided into mapping periods.
No	version	String	Creation timestamp for an individual version of the Contract Subaccount Mapping, from version in GET. POST should repeat this element, though it will not affect any data in the IBT application.
No	subaccount_id	String	Subaccount ID specified for an individual version of the Contract Subaccount Mapping. The Contract Subaccount Mapping in the IBT application will be updated to reflect this version, so that the contract is mapped to this subaccount during this mapping period.

3.2.5 Additional Value Restrictions

Field	Definition	Rules
contract_id	ISO New England-specified contract unique numeric ID for a Contract Subaccount Mapping being changed.	contract_id must not be repeated within the request message body. Each Contract Subaccount Mapping must have a unique contract_id. The Market Participant must be a party to this contract.

begin, end	Mapping period begin/end date/time for an individual version of the Contract Subaccount Mapping.	begin must be later than or the same as the contract period's begin. end must be earlier than or the same as the contract period's end. begin must be earlier than end. begin and end must belong to a single month. Each Contract Subaccount Mapping version should have a unique mapping period month.
subaccount_id	Subaccount ID specified for an individual version of the Contract Subaccount Mapping.	subaccount_id must represent a subaccount belonging to the Market Participant and defined as of the mapping period begin.

3.2.6 Sample Request – GET request

To return a collection of Contract Subaccount Mappings belonging to the Market Participant:
- as of August 2015,
- and up to the first 25 Contract Subaccount Mapping versions,

the Market Participant with numeric ID 1 may request the URL:

https://smd.iso-ne.com/sms_oper_contract/api/customers/1/contractSubaccountMappings?start_date=08%2F01%2F2015&start=0&limit=25

3.2.7 Sample Request – GET response

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<contract_subaccount_mappings xmlns="http://xmlns.iso-ne.com/contract/customers">
 <query_info>
 <total_record_count>2</total_record_count>
 </query_info>
 <contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999998</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>QRS Ltd</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-01T04:00:00Z</version>
  <subaccount_id>Default</subaccount_id>
 </contract_subaccount_mapping_version>
```

```
</contract_subaccount_mapping>
<contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999999</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>TUV LLC</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-02T06:00:00Z</version>
  <subaccount_id>Default</subaccount_id>
 </contract_subaccount_mapping_version>
</contract_subaccount_mapping>
</contract_subaccount_mappings>
```

3.2.8 Sample Request – POST request

To update the above collection of Contract Subaccount Mappings so that contract 999999 is mapped to subaccount ABC1 for August 2015, the Market Participant with numeric ID 1 may request a POST to URL:

https://smd.iso-ne.com/sms_oper_contract/api/customers/1/contractSubaccountMappings

with request header:

Content-Type: application/vnd.iso-ne.contract.customers.v1+xml;charset=UTF-8

and request message body:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<contract_subaccount_mappings xmlns="http://xmlns.iso-ne.com/contract/customers">
<contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999998</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>QRS Ltd</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-01T04:00:00Z</version>
  <subaccount_id>Default</subaccount_id>
 </contract_subaccount_mapping_version>
```

```xml
</contract_subaccount_mapping>
<contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999999</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>TUV LLC</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-02T06:00:00Z</version>
  <subaccount_id>ABC1</subaccount_id>
  </contract_subaccount_mapping_version>
 </contract_subaccount_mapping>
</contract_subaccount_mappings>
```

3.2.9 Sample Request – POST response

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<contract_subaccount_mappings xmlns="http://xmlns.iso-ne.com/contract/customers">
<contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999998</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>QRS Ltd</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-01T04:00:00Z</version>
  <subaccount_id>Default</subaccount_id>
  </contract_subaccount_mapping_version>
</contract_subaccount_mapping>
<contract_subaccount_mapping>
 <customer_id>1</customer_id>
 <contract_id>999999</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>TUV LLC</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
```

```
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-11T12:01:22Z</version>
  <subaccount_id>ABC1</subaccount_id>
 </contract_subaccount_mapping_version>
</contract_subaccount_mapping>
</contract_subaccount_mappings>
```

If errors are encountered, a client error response will be returned as described in Section 2.1

3.3 Customer's Contract Subaccount Mapping for contract

3.3.1 Purpose of Message

Returns the Contract Subaccount Mapping belonging to the Market Participant indicated by the *customerId* parameter, for the contract indicated by the *contractId* parameter. Includes a sequence of versions, with one current version and zero or more historical versions for every mapping period during the contract.

3.3.2 REST Endpoint

https://smd.iso-ne.com/sms_oper_contract/api
/customers/{customerId}/contractSubaccountMappings/{contractId}

3.3.3 Request Method

HTTP GET

3.3.4 Mandatory and Optional Fields

Parameters:
- *customerId* – Market Participant's unique numeric ID at ISO New England.
- *contractId* – Contract's unique numeric ID assigned by ISO New England.

3.3.5 Sample Request

The Market Participant with numeric ID 1 and a contract with numeric ID 999999 may request:

GET https://smd.iso-ne.com/sms_oper_contract/api
/customers/1/contractSubaccountMappings/999999

3.3.6 Data Returned

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<contract_subaccount_mapping xmlns="http://xmlns.iso-ne.com/contract/customers">
 <customer_id>1</customer_id>
 <contract_id>999999</contract_id>
 <market_name>FCM Load</market_name>
 <buyer_name>XYZ Inc</buyer_name>
 <seller_name>TUV LLC</seller_name>
 <contract_begin>2015-08-01T04:00:00Z</contract_begin>
 <contract_end>2015-10-01T04:00:00Z</contract_end>
 <status>Conf</status>
 <contract_subaccount_mapping_version>
  <begin>2015-08-01T04:00:00Z</begin>
  <end>2015-09-01T04:00:00Z</end>
  <version>2015-07-02T06:00:00Z</version>
```

```
 <subaccount_id>Default</subaccount_id>
 </contract_subaccount_mapping_version>
 <contract_subaccount_mapping_version>
 <begin>2015-08-01T04:00:00Z</begin>
 <end>2015-09-01T04:00:00Z</end>
 <version>2015-07-11T12:01:22Z</version>
 <subaccount_id>ABC1</subaccount_id>
 </contract_subaccount_mapping_version>
 <contract_subaccount_mapping_version>
 <begin>2015-09-01T04:00:00Z</begin>
 <end>2015-10-01T04:00:00Z</end>
 <version>2015-07-02T06:00:00Z</version>
 <subaccount_id>Default</subaccount_id>
 </contract_subaccount_mapping_version>
</contract_subaccount_mapping>
```

4. Customer Support

4.1 By Internet

http://www.iso-ne.com/participate/support

4.2 By Telephone

Days of Operation

During Regular Business Hours, Monday through Friday: 8:00 A.M. to 5:00 P.M. ET:
(413) 540-4220

The Customer Support Hotline is **NOT** staffed on the following days:

New Year's Day	Labor Day
Martin Luther King Day	Columbus Day
Presidents Day	Veterans Day
Good Friday	Thanksgiving Day
Patriots Day	Day After Thanksgiving
Memorial Day	Christmas Eve Afternoon (12:00 to 17:00)
Independence Day	Christmas Day

For after-hours business emergencies, contact Customer Support at **(877) 226-4814** (pager).

4.3 By Email

custserv@iso-ne.com

4.4 Ask ISO

Ask ISO is available to market participants who have a valid digital certificate and who have been   assigned the role of "Ask ISO / External User" by their Security Administrator. Ask ISO is located at:
http://www.iso-ne.com/about/contact/customer-support

5. Links

5.1 ISO New England Home Page

http://www.iso-ne.com

5.2 ISO New England Training Page

http://www.iso-ne.com/participate/training

5.3 ISO New England FAQ Page

http://www.iso-ne.com/participate/support/faq

5.4 SMD Site for ISO Applications

https://smd.iso-ne.com/

5.5 SMD Site for ISO Sandbox Applications

https://sandboxsmd.iso-ne.com/

5.6 ISO New England Glossary and Acronyms

http://www.iso-ne.com/participate/support/glossary-acronyms