****

**ISO-New England External Transaction Tool (NEXTT) Web Services Guide**

**© ISO New England Inc.**

**september 2019**

**VERSION 3**

**ISO-NE Public USE**

Contents

[1. About This Document 3](#_Toc9341987)

[1.1 Scope and prerequisite knowledge 3](#_Toc9341988)

[2. Software Application Access and User Roles 3](#_Toc9341989)

[2.1 Company Access to Application 3](#_Toc9341990)

[2.2 User Roles 3](#_Toc9341991)

[3. NEXTT XSD 4](#_Toc9341992)

[4. Notes on Submitting Transactions 4](#_Toc9341993)

[5. Notes on Modifications 5](#_Toc9341994)

[5.1 Summary of Modification Deadlines 5](#_Toc9341995)

[5.2 Considerations for Transaction Header Data 5](#_Toc9341996)

[5.3 Changes to Interval Data 6](#_Toc9341997)

[5.3.1 New Data Replaces Previous Data 6](#_Toc9341998)

[5.3.2 DA DETAILS Section 6](#_Toc9341999)

[5.3.3 RT DETAILS Section 6](#_Toc9342000)

[5.4 Changes to Other Real-Time Data 7](#_Toc9342001)

[5.4.1 OPTIONS Data 7](#_Toc9342002)

[5.4.2 OASIS Data 7](#_Toc9342003)

[6. Upload/Download in the GUI 8](#_Toc9342004)

[7. Programmatic Upload/Download 8](#_Toc9342005)

[7.1 NEXTT Web Service Design 8](#_Toc9342006)

[7.2 Accessing the NEXTT Web Services 8](#_Toc9342007)

[7.3 NEXTT Web Services 9](#_Toc9342008)

[7.3.1 Get Transaction 9](#_Toc9342009)

[7.3.2 Search For Transactions 10](#_Toc9342010)

[7.3.3 Create New Transaction 11](#_Toc9342011)

[7.3.4 Update Transaction 12](#_Toc9342012)

[8. Submittal Response Message 13](#_Toc9342013)

[8.1 Header Information 13](#_Toc9342014)

[8.2 Submittal Status 13](#_Toc9342015)

[8.3 Transactions Issues 13](#_Toc9342016)

[8.4 Interval Issues 14](#_Toc9342017)

[8.5 Sample Submittal Response Message 14](#_Toc9342018)

[9. Data Definition 15](#_Toc9342019)

[10. Transaction Validation Process 16](#_Toc9342020)

[10.1 Resulting Interval Status 16](#_Toc9342021)

[10.2 Validations on All Transactions 16](#_Toc9342022)

[10.3 Validations on DAM Transactions 17](#_Toc9342023)

[10.4 Validations on RTM Transactions 17](#_Toc9342024)

[11. Record of Revisions 18](#_Toc9342025)

[APPENDIX A. File Upload, New Transaction Examples 19](#_Toc9342026)

[APPENDIX B. File Upload, Transaction Modification Examples 23](#_Toc9342027)

[APPENDIX C. Sample of Programmatic Processing 25](#_Toc9342028)

[APPENDIX D. Error Codes 29](#_Toc9342029)

# About This Document

This document contains details on the structure and use of the Extensible Markup Language (XML) format to upload and download transactions and the web services available to upload and download transactions without using a user interface. The NEXTT User Guide, describing the user interface and displays will be available prior to the software release to the sandbox.

There are a number of changes to fundamental business rules that should be reviewed before creating an upload process. See: [Business Rules Summary](https://www.iso-ne.com/static-assets/documents/2019/05/summary-of-business-rule-changes-with-ees-replacement.pdf)

User should review the ISO New England Tariff and Manual 11 “ISO New England Manual for

Market Operations” for additional detail and obligations regarding the submittal of external transactions.

## Scope and prerequisite knowledge

Users should be familiar with Extensible Markup Language (XML), Web Services, HTTP/HTTPS protocols. Additional information about Extensible Markup Language (XML), Web Services, and other helpful information can be found at the following web locations:

XML:

* http://www.w3.org > XML Technology
* http://www.w3schools.com > Learn XML

 Web Services:

* http://www.w3.org > Web Service Technology
* http://www.w3schools.com > Learn Web Services

REST:

* http://www.packetizer.com/ws/rest.html

# Software Application Access and User Roles

## Company Access to Application

Access to NEXTT is granted through ISO-NE’s Customer and Asset Management System (“CAMS”) application. Before ISO-NE can grant a company access to NEXTT, the company must be registered to submit external transactions as defined [here](https://www.iso-ne.com/participate/support/faq/external-transactions-interfaces#a).

Registered users may access the production version of the NEXTT User Interface through the ISO New England SMD Applications Home Page at: <https://smd.iso-ne.com/> by selecting “External Transactions”.

## User Roles

The two available roles for the NEXTT application are Read and Read/Write. Any user with Read/Write permission can also utilize NEXTT Web Services. Once the company has completed all the registration steps, the Security Administrator should assign the appropriate role to each of the company’s user through the Customer and Asset Management System (CAMS). The sandbox and production environments are listed separately in CAMS. Therefore, the Security Administrator must apply the roles separately for the sandbox and the production environments.

## Sandbox Environment

The purpose of the sandbox environment is to allow a customer to become familiar with the NEXTT user interface and to test file upload and download processes. The sandbox environment is connected to the [OATI eTag Demo System](https://demo.tag.oati.com/oati/ets-login.wml). There is no direct connection to any OASIS site. The OASIS reservations are stored offline and will be updated whenever the sandbox environment is refreshed. Import Resource information is only updated periodically and may not have production data. The validation requiring that the eTag reference the same OASIS reservation as the transaction will be turned OFF in this environment.

Be aware that there is no Day-Ahead (DA) Energy Market clearing in this environment nor any Real-Time (RT) Energy Market scheduling. Therefore, the ‘results’ areas of NEXTT will not be populated in this environment.

The URL for the sandbox environment is: <https://sandboxsmd.iso-ne.com/>.

# NEXTT XSD

All of the data exchanges using the NEXTT web services are bound by types defined in the NEXTT XML Schema Definition XSD file: [NEXTT Web Services V1.xsd](https://www.iso-ne.com/static-assets/documents/2019/05/nextt-web-services-v1.xsd). A single XSD file contains information for uploading a transaction, the response to that upload and downloading transaction data.

The content related to transaction submittal contains three separate groupings of data. The first grouping contains what is referred to as the header information that is applicable to both the Day Ahead Market (DAM) and Real Time Market (RTM) aspects of the transaction. The second and third grouping are the data specific to the Day Ahead and Real Time aspects of the transaction, respectively.

# Notes on Submitting Transactions

The notes below provide some important information to consider when creating a process to generate XML files.

* The elements must be presented in the order shown in the schema
* The tag labels are case sensitive
* The customer referenced in the file must align with the certificate being used
* Time format options:

|  |  |
| --- | --- |
| **Time format** | **Resulting time** |
| 2018-05-12T04:00:00Z | 4:00 am on May 12, 2018 UTC |
| 2018-05-12T04:00:00-05:00 | 4:00 am on May 12, 2018 Eastern Standard Time |
| 2018-05-12T04:00:00 | 4:00 am on May 12, 2018 Eastern Prevailing Time(does not support data changing over the time change during the 25 hour day) |

* Empty vs null
	+ An empty tag is NOT the same as null
	+ To set a tag to null you must either:
		- Not include that element
		- Use xsi:nil="true" attributes
			* xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/
		- Alternatively, the nil attribute can be referenced in the TRANSACTION tag which allows for reduced content in the body; see Appendices for examples.
	+ Examples where tag must be null if included
		- Price field must be null if the type is self-scheduled
		- ISO-NE must be null for new submittals
	+ Examples where null is always ***required***
		- Sink must be null if Direction = Import
		- Source must be null if Direction = Export

# Notes on Modifications

Once a transaction is submitted, it can be modified in the GUI or through the XML up until the market deadlines defined in the Tariff. The information below should be reviewed before creating a process to generate XML files that modify transactions.

## Summary of Modification Deadlines

|  |  |  |
| --- | --- | --- |
| Transaction Type | Initial Submittal | Modifications |
| DAM(no RT Type) | Transaction must be created by DAM deadline  | * MW can be added/modified for future days so long as the DAM deadline is open for that day.
* No header information can be modified after the DAM deadline based on the first day of the transaction
 |
| RT Type = Priced(with or without DAM data) | Transaction must be created by DAM deadline | * MW can be added/modified for future days so long as the DAM deadline is open for that day.
* Price can be changed during Re-offer period
* Transaction header information, eTag, OASIS and Options can be modified up to 60 minutes before the earliest RT start of the transaction
* MW can be reduced prior to 60 minutes of the start of that hour
 |
| RT Type = Self Scheduled (with or without DAM data) | Transaction can be created up to 60 minutes before start of transaction | * Transaction header information, eTag, OASIS and Options can be modified up to 60 minutes before the earliest RT start of the transaction
* MW can be added or modified up to 60 minutes prior to the start of that hour
 |

## Considerations for Transaction Header Data

* When data in the header is modified, EVERY interval on the transaction is re-validated.
* Header information that was present in the initial submittal must be present in the modification. If a field is present in the original and not present in the update, the field will be assumed to be removed from the transaction.
* Since Customer, Direction, Source and/or Sink are required fields, they must be present with every submittal
* eTag ID must be present with every submittal where it is required
* The other fields in the transaction header (Import Resource, Outside ID, Outside Name) are not required so do not need to be included. However, if they are present in the original transaction and not present in the modification, the field will be assumed to be removed from the transaction.

## Changes to Interval Data

### New Data Replaces Previous Data

When data in any interval is modified, the new data replaces the previously submitted data in its entirety. If the previously submitted data for an interval was APPROVED and the new data for an interval has a status of PENDING and the issues are not resolved prior to the market deadline, the interval will be set to DENIED; it will not revert back to the previously APPROVED data.

### DA DETAILS Section

The DA DETAILS section should only be included if there are changes occurring to that data

* DA\_TRANSACTION\_TYPE must be included
* If original transaction included UP\_TO\_CONGESTION\_LOCATION\_NAME, the modification must include that data
* All intervals included will be validated
	+ Intervals for which the market deadline has passed cannot be included
	+ Any intervals not included will be unchanged

### RT DETAILS Section

The RT DETAILS section should only be included if there are changes occurring to that data

* RT\_TRANSACTION\_TYPE must be included
* All intervals included will be validated
	+ Intervals for which the market deadline has passed cannot be included
	+ Any intervals not included will be unchanged

## Changes to Other Real-Time Data

Modifications to other real-time data can include the Options (e.g. Grandfathered transactions, Non-CSO Export, GIS IDs, etc.) and OASIS IDs. The segments below detail how to handle modifications to these fields via XML file upload.

### OPTIONS Data

* If the section is not present, no change is made to the option data
* If the section is present with data and it’s the same data, the system will recognize data was not changed
* If the section is present with data and the data is different this will result in revalidation of ALL intervals in the transaction
	+ Data cannot be changed after deadline for earliest start
* If the section is present but no details are included, this will remove all Options from the transaction

### OASIS Data

* If the section is not present, no change is made to the OASIS data
* If the section is present with data and it’s the same data, the system will recognize data was not changed
* If the section is present with data and the data is different this will result in revalidation of ALL intervals in the transaction
	+ Data cannot be changed after deadline for earliest start
* If the section is present but no details are included, this will remove all OASIS reservations from the transaction

# Upload/Download in the GUI

Users can upload an XML file in the NEXTT GUI and download XML results from the NEXTT Organizer. Details of those actions are contained in the NEXTT User Guide; which will be posted before the release of the Sandbox.

# Programmatic Upload/Download

The programmatic upload and download feature is available for the customer to submit and retrieve transactions without interacting with a user interface. This section describes how to use this feature.

## NEXTT Web Service Design

These operations describe the messages that are used to exchange data between a Market Participant and ISO-NE using NEXTT web services. The web service operation messages use the REST format for data transmission. All web service operations follow a request/reply pattern that is typical of HTTP(S) communication. There are some web service operations that simply have query messages, and they are used for the sole purpose of requesting specific data from the NEXTT application.

A request may contain a message that submits or modifies data or it may contain a message that queries for data. A reply contains a message that is either: 1) a confirmation of data modification, including warnings when applicable, 2) an error, or 3) the response to a query.

## Accessing the NEXTT Web Services

The NEXTT web services are based on REST over HTTPS (version 1.1). A client application that accesses NEXTT 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. ISO New England provides limited support for Java by providing sample implementations in Appendix C.

## NEXTT Web Services

### Get Transaction

|  |  |
| --- | --- |
| **URL** | https://smd.iso-ne.com/nextt/api/transactions/{isoneId} |
| **Method** | GET |
| **URL Headers** | Accept: application/xmlProduces: application/xml |
| **URL Parameters** | Required: isoneId as whole number |
| **Query Parameters** | NA  |
| **Data Parameters** | NA |
| **Required Roles** |  Read |
| **Success Response** | Code: *200*Success. Returns a NEXTT ***TRANSACTION***CIM object  |
| **Error Response** | Code: *400 Bad Request*. Missing ISO-NE ID.Code: *404 Not Found*, or transaction does not belong to requesting customerCode: *500 Internal Server Error*. Contact ISO-NE.  |
| **Notes** | * This process does not provide results for CTS interface bids submitted to NYISO JESS
* Response will contain any DAM cleared results and RTM scheduled results whenever they are available.
	+ Due to possible hourly variation, every interval will be presented separately
 |

### Search For Transactions

|  |  |
| --- | --- |
| **URL** | https://smd.iso-ne.com/nextt/api/transactions/ |
| **Method** | GET |
| **URL Headers** | Accept: application/xmlProduces: application/xml |
| **URL Parameters** | NA |
| **Query Parameters** | Required:* **startdate**=[Date], in format of **yyyyMMdd**
* **enddate**=[Date], in format of **yyyyMMdd**

Optional:* **markettype (default = all)**
	+ DA
	+ RT
* **rtstatus (default = all)**
	+ APPROVED
	+ DENIED
	+ ISOREVIEW
	+ PENDING
	+ WITHDRAWN
* **applydaterestrictions (default = true)**
	+ true
	+ false
 |
| **Data Parameters** | https://smd.iso-ne.com/nextt/api/transactions?startdate=20180201&enddate=20180201https://smd.iso-ne.com/nextt/api/transactions?startdate=20180201&enddate=20180201&markettype=RThttps://smd.iso-ne.com/nextt/api/transactions? startdate=20180201&enddate=20180201&markettype=RT&rtstatus=APPROVEDhttps://smd.iso-ne.com/nextt/api/transactions??startdate=20180201&enddate=20180201&applydaterestrictions=false |
| **Required Roles** |  Read |
| **Success Response** | Code: *200*Success. Returns a NEXTT ***TRANSACTION***CIM object  |
| **Error Response** | Code: *400 Bad Request*. Too many transactions being returned or missing required parameters or too many transactions returnedCode: 500 Internal Server Error. Contact ISO-NE. |

|  |  |
| --- | --- |
| **Notes** | * Download shall be limited to 200 transactions (ISO-NE IDs)
	+ This process does not provide results for CTS interface bids submitted to NYISO JESS
* Response will contain any DAM cleared results and RTM scheduled results whenever they are available.
	+ Due to possible hourly variation, every interval will be presented separately
* Only one **rtstatus** can be identified in a request
* To request data for a single day, the startdate and enddate must be the same
* If **applydaterestrictions** = true (default), results will only contain data for the selected days even of the transaction is longer than the selected date range.
	+ For example, if transactions 5/15/2016 is selected and there is a month long transaction in May 2016, only the results for 5/15/2016 shall be included in the download.
* If **applydaterestrictions** = false, results will contain all data associated with the ISO-NE IDs that satisfy the criteria.
	+ For example, if it is a month long transaction and user requested one day of that month, all days of that transaction would be present.
 |

### Create New Transaction

|  |  |
| --- | --- |
| **URL** | https://smd.iso-ne.com/nextt/api/transactions/ |
| **Method** | POST |
| **URL Headers** | Accept: application/xmlProduces: application/xml |
| **URL Parameters** | NA |
| **Query Parameters** | NA  |
| **Data Parameters** | See Appendix A for examples |
| **Required Roles** | Read/Write |
| **Success Response** | Code: *200 Success*. Return a NEXTT **SUBMITTAL\_RESPONSE** CIM object with an overall submittal status as described in Section 8. |
| **Error Response** | Code: *400 Bad Request*. Submittal contains an xml parsing error.Code: *403 Unauthorized.* Submittal may have incorrect certificate or Read only role.Code: *500 Internal Server Error.* Contact ISO-NE. |

### Update Transaction

|  |  |
| --- | --- |
| **URL** | https://smd.iso-ne.com/nextt/api/transactions/{isoneId} |
| **Method** | PUT |
| **URL Headers** | Accept: application/xmlProduces: application/xml |
| **URL Parameters** | NA |
| **Query Parameters** | NA  |
| **Data Parameters** |

|  |
| --- |
|  |

See examples in Appendix B |
| **Required Roles** | Read/Write |
| **Success Response** | Code: *200*Success. Returns a NEXTT **SUBMITTAL\_RESPONSE** CIM object with an overall submittal status as described in Section 8. |
| **Error Response** | Code: *400 Bad Request*. Submittal contains an xml parsing error.Code: *403 Unauthorized.* Submittal may have incorrect certificate or Read only role.Code: *500 Internal Server Error.* Contact ISO-NE. |

# Submittal Response Message

The file upload response provides the ISO-NE ID created, some key information to identify the transaction, the overall status of the submittal, a list of issues applicable to the overall transactions, and a list of issues applicable to specific intervals.

The **Submittal Status** indicates the overall result of the process. The **Transactions Issues** section identifies errors that are associated with information in the header of the transaction and therefore apply to ALL intervals of the transactions. The **Interval Issues** section identifies errors that are associated with a specific interval.

## Header Information

The following information will be presented on every submittal response message

* CUSTOMER
* OUTSIDE\_REFERENCE\_NAME (if provided)
* OUTSIDE\_REFERENCE\_ID (if provided)
* SOURCE and/or SINK (only what is applicable)
* ETAG\_ID (if provided)
* ISONE\_ID

## Submittal Status

This section will be present on every response.

|  |  |
| --- | --- |
| **Indicator** | **Description** |
| SUCCESS | No issues were identified* If DA, transaction is accepted
* If RT, all intervals have RT status = APPROVED
 |
| REJECTED | Issues were identified that prevented the file upload from being processed |
| ACCEPTED WITH ERROR | The file upload was accepted but issues were found with one or more RT intervals.  |

## Transactions Issues

Each issue will include a severity level and additional information regarding the detail of the issue identified. This section will only be present if there are transaction issues to report.

Appendix D lists many of these codes.

|  |  |
| --- | --- |
| **Severity** | **Description** |
| FATAL | Evaluation of the file upload is terminated. Submittal status will be REJECTED. |
| ERROR | Issues were identified that prevented the RT transaction from being approved. RT Status for all intervals is likely PENDING. |
| WARNING | Minor issues were identified that did not impact the final status of the transaction.  |

## Interval Issues

The interval level evaluation only occurs if there are no FATAL errors in the overall transaction validation. Each issue will include a severity level and additional information regarding the detail of the issue identified. This section will only be present if there are interval issues to report. It is possible that every interval is impacted by the same issue in which case that error will be repeated for each affected interval.

Appendix D lists many of these codes.

|  |  |
| --- | --- |
| **Severity** | **Description** |
| FATAL | Evaluation of the file upload is terminated. Submittal status will be REJECTED. |
| ERROR | Issues were identified that prevented the RT transaction from being approved. RT Status for all intervals is likely PENDING |
| WARNING | Minor issues were identified that did not impact the final status of the transaction  |

## Sample Submittal Response Message

<?xml version="1.0" encoding="UTF-8"?><SUBMITTAL\_RESPONSE xmlns="http://www.iso-ne.com/2018/nextt">

 <ISONE\_ID>4013511</ISONE\_ID>

 <CUSTOMER\_ID>12345</CUSTOMER\_ID>

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>ISNE\_ABCDE033459\_NYIS</ETAG\_ID>

 <SUBMITTAL\_STATUS>SUCCESS</SUBMITTAL\_STATUS>

 <TRANSACTION\_ISSUES>

 <ISSUE>

 <CODE>etag.not.exist</CODE>

 <SEVERITY>WARNING</SEVERITY>

 <MESSAGE>eTag ID referenced does not exist at OATi</MESSAGE>

 </ISSUE>

 </TRANSACTION\_ISSUES>

 <INTERVAL\_ISSUES>

 <ISSUE>

 <INTERVAL\_BEGIN>2019-05-04T04:00:00Z </ INTERVAL\_BEGIN >

 <CODE>general.price.not.allowed</CODE>

 <SEVERITY>ERROR</SEVERITY>

 <MESSAGE>Price is not allowed with Transaction Type selected: 0</MESSAGE>

 </ISSUE>

 </INTERVAL\_ISSUES>

</SUBMITTAL\_RESPONSE>

# Data Definition

Below is a list of the data used in the transaction upload and download. The table indicates the data type/content, and in some cases the list of valid items. It also indicates where in the file the data is located and whether the data is used in the upload, the download, or both.

| **XML TAG** | **Data type/Content** | **Where located****(Header/DA/RT)** | **Where used****(upload/download)** |
| --- | --- | --- | --- |
| ISONE\_ID | INTEGER | Header | Both |
| OUTSIDE\_REFERENCE\_NAME | STRING <= 50 | Header | Both |
| OUTSIDE\_REFERENCE\_ID | STRING <=20 | Header | Both |
| RESPONSIBLE\_CUSTOMER\_ID | INTEGER | Header | Both |
| DIRECTION | IMPORTEXPORTTHROUGH | Header | Both |
| SOURCE\_INTERFACE\_PNODE\_NAME | External Pnode Name | Header | Both |
| SINK\_INTERFACE\_PNODE\_NAME | External Pnode Name | Header | Both |
| ETAG\_ID | STRING <= 50 | Header | Both |
| IMPORT\_RESOURCE\_ID | INTEGER | Header | Both |
| SUBACCOUNT\_ID | STRING<=100 | Header | Both |
| DA\_TRANSACTION\_TYPE | PRICEDSELF SCHEDULEDUPTO CONGESTION | DA | Both |
| RT\_TRANSACTION\_TYPE | PRICEDSELF SCHEDULED | RT | Both |
| UP\_TO\_CONGESTION\_LOCATION\_NAME | Hub/Load Zone Pnode Name | DA | Both |
| DA\_STATUS | VALIDINVALID | DA | Download |
| RT\_STATUS | APPROVEDDENIEDISOREVIEWPENDINGWITHDRAWN | RT | Download |
| INTERVAL\_BEGIN | DATETIME | DA, RT | Both |
| INTERVAL\_END | DATETIME | DA, RT | Both |
| BID\_MW | INTEGER | DA, RT | Both |
| BID\_PRICE | DECIMAL (2 digit) | DA, RT | Both |
| CLEARED\_MW | DECIMAL (3 digit) | DA, RT | Download |
| CLEARED\_PRICE | DECIMAL (2 digit) | DA | Download |
| REOFFER\_FLAG | BOOLEAN | RT | Download |
| CHANGE\_REASON | STRING <= 200 | RT | Download |
| OASIS\_RESERVATIONS | INTEGER | RT | Both |
| EMERGENCY\_ENERGY\_TXN\_FLAG | BOOLEAN | RT | Both |
| SECURITY\_ENERGY\_TXN\_FLAG | BOOLEAN | RT | Both |
| GIS\_ID | STRING <= 20 | RT | Both |
| GRANDFATHERED\_OASIS\_ID | INTEGER | RT | Both |
| NON\_CSO\_EXPORT\_ASSET\_ID | INTEGER | RT | Both |
| LSCC\_EXPORT\_ASSET\_ID | INTEGER | RT | Both |
| UNCONSTRAINED\_EXPORT\_ASSET\_ID | INTEGER | RT | Both |
| EXCEPTED\_TRANSACTION\_FLAG | INTEGER | RT | Both |

# Transaction Validation Process

## Resulting Interval Status

The results of the validation will determine the status for ***each RT interval*** on the transaction as described below.

|  |  |
| --- | --- |
| **Interval Status** | **Description** |
| APPROVED | * Status automatically assigned when all validations are successful
* ISO-NE employee has the ability to set the status to APPROVED if automated processes are not working properly
	+ An example of when this action might be taken is if there are issues with the ISO connectivity to the eTag database preventing comparison of the eTag data to the transaction data
 |
| PENDING (PENDING ACTION\*) | * Status automatically assigned when issues are identified with eTag, OASIS or market option validations.
* It is the responsibility of the customer to resolve this issue.
* ISO-NE will automatically re-validate intervals in this state every 5 minutes; if all issues are resolved the status will move to APPROVED
 |
| ISO REVIEW | * Status automatically assigned when all validations are successful and the market option Unconstrained Export is selected
* An ISO-NE employee will review the information referenced in the transaction and move the status to APPROVED or DENIED
 |
| DENIED | * Any interval of a transaction that is in the status of PENDING or ISO REVIEW at the close of the self-schedule market deadline the status will be automatically set to DENIED
* An ISO-NE employee has the ability to set the status to DENIED if requested by the customer
 |

\*the full name of the status is PENDING ACTION, which is seen in the GUI, but PENDING is used in the XSD

## Validations on All Transactions

Below are data validations applied to all transactions

|  |  |
| --- | --- |
| **Field** | **Validation** |
| MW | * must be whole number
* must be <=999
 |
| Price | * Priced transactions must be between floor and ceiling energy caps
* Up-to Congestion transactions must be between $0.01 and $25.00
* Must not be present or be null if the type is self-scheduled
 |
| Outside Name | * Alpha-numeric string <=50 characters
 |
| Outside ID | * Alpha-numeric string <=20 characters
 |
| Sub Account | * Selection from dropdown of valid accounts as defined in CAMS
* Default applied if none selected
 |
| Import Resource  | * Import Capacity Resource ID if transaction is being submitted in support of FCM obligation
* Must be a valid Import Capacity Resource ID
 |
| Direction/Source/Sink | * Direction and Source/Sink data must be consistent
* Source and Sink cannot be in the same control area
* Through transactions cannot be in the DAM and must be Self Scheduled.
* Import and Export cannot occur on the NYN interface
 |

## Validations on DAM Transactions

Additional validations performed on DAM transactions

|  |  |
| --- | --- |
| **Field** | **Validation** |
| eTag | * If on CTS interface and eTag ID not present, transaction not accepted
* Cannot be repeated within 12 months
* Warning presented if tag does not exist
 |

## Validations on RTM Transactions

Additional validations performed on RTM transactions

|  |  |
| --- | --- |
| **Field** | **Validation** |
| eTag | * If eTag ID is not present, transaction is not accepted
* Cannot be repeated within 12 months
* If tag has an invalid status, transaction is not accepted
* If tag does not exist, status for all intervals will be PENDING
* If tag is in status = Pending, status for all intervals will be PENDING
* If OASIS referenced in eTag is different that OASIS linked to reservation, transaction is not accepted
* If eTag MW less than transaction MW, interval status will be PENDING
	+ eTag MW and transaction MW do not need to match exactly
 |
| OASIS | * If not present for non-PTF interface, transaction is not accepted
* If customer submitting transaction is not the same as the customer that owns the reservation, transaction is not accepted
	+ Customer owning the OASIS reservation can notify ISO-NE of other companies than can utilize their reservations
* If status of reservation is anything other than CONFIRMED, transaction is not accepted
* If OASIS does not exist, status for all intervals will be PENDING ACTION
 |
| Import Resource | * Import Resource ID must exist.
* If MW on Import Resource ID are overused for any hour, interval status will be PENDING
 |
| Non-CSO Export | * If Asset ID referenced does not have a capacity export recorded at ISO, all interval statuses will be PENDING
* If MW on referenced Asset ID are overused for any hour, interval status will be PENDING
 |
| LSCC Export | * Asset ID referenced must have an associated Administrative De-List bid
* If MW on referenced Asset ID are overused for any hour, interval status will be PENDING
 |
| Unconstrained Export | * If all validations pass, all intervals statuses will be set to ISO REVIEW so that ISO can verify the location of the referenced Asset ID
 |
| Grandfathered | * Must be self-scheduled, submitted prior to the DAM deadline and include MGTSA OASIS ID in Option data (NOT linked as an OASIS reservation)
 |

Note: The status PENDING will appear as PENDING ACTION in the GUI

# Record of Revisions

|  |  |  |
| --- | --- | --- |
| **Revision** | **Date** | **Changes** |
| Initial | 5/20/2019 |  |
| 2.0 | 8/3/2019 | * Examples in description of null vs empty were updated
* Description of applydaterestrictions = true was updated
* Included validation of eTag OASIS and transaction OASIS
* Updated Section 2 to be consistent with NEXTT User Guide
 |
| 3.0 | 9/26/2019 | * Modify Subaccount ID data type from integer to string
 |

# APPENDIX A. File Upload, New Transaction Examples

**A1. Transaction with Only Day Ahead Data**

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>NYIS\_ABCDE033459\_ISNE</ETAG\_ID>

 <IMPORT\_RESOURCE>12345</IMPORT\_RESOURCE>

 <DA\_DETAIL>

 <DA\_TRANSACTION\_TYPE>UPTO CONGESTION</DA\_TRANSACTION\_TYPE>

 <UP\_TO\_CONGESTION\_LOCATION\_NAME>.Z.NEMASSBOST</UP\_TO\_CONGESTION\_LOCATION\_NAME>

 <DA\_INTERVALS>

 <DA\_INTERVAL>

 <INTERVAL\_BEGIN>2019-05-04T04:00:00Z</INTERVAL\_BEGIN>

 <INTERVAL\_END>2019-05-05T06:00:00Z</INTERVAL\_END>

 <BID\_MW>5</BID\_MW>

 <BID\_PRICE>3.33</BID\_PRICE>

 </DA\_INTERVAL>

 </DA\_INTERVALS>

 </DA\_DETAIL>

</TRANSACTION>

SUBMITTAL RESPONSE

<?xml version="1.0" encoding="UTF-8"?><SUBMITTAL\_RESPONSE xmlns="http://www.iso-ne.com/2018/nextt">

 <ISONE\_ID>4013509</ISONE\_ID>

 <CUSTOMER\_ID>12345</CUSTOMER\_ID>

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>ISNE\_ABCDE033459\_NYIS</ETAG\_ID>

 <SUBMITTAL\_STATUS>SUCCESS</SUBMITTAL\_STATUS>

 <TRANSACTION\_ISSUES>

 <ISSUE>

 <CODE>etag.not.exist</CODE>

 <SEVERITY>WARNING</SEVERITY>

 <MESSAGE>eTag ID referenced does not exist at OATi</MESSAGE>

 </ISSUE>

 </TRANSACTION\_ISSUES>

</SUBMITTAL\_RESPONSE>

**A2. Transaction with Only Real Time Data**

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQHIGATE120 2</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ISNETMW0010\_ISNE</ETAG\_ID>

 <RT\_DETAIL>

 <RT\_TRANSACTION\_TYPE>SELF SCHEDULED</RT\_TRANSACTION\_TYPE>

 <RT\_INTERVALS>

 <RT\_INTERVAL>

 <INTERVAL\_BEGIN>2019-05-03T09:00:00Z</INTERVAL\_BEGIN>

 <INTERVAL\_END>2019-05-03T11:00:00Z</INTERVAL\_END>

 <BID\_MW>10</BID\_MW>

 </RT\_INTERVAL>

 </RT\_INTERVALS>

 </RT\_DETAIL>

</TRANSACTION>

SUBMITTAL RESPONSE

<?xml version="1.0" encoding="UTF-8"?><SUBMITTAL\_RESPONSE xmlns="http://www.iso-ne.com/2018/nextt">

 <ISONE\_ID>4013511</ISONE\_ID>

 <CUSTOMER\_ID>12345</CUSTOMER\_ID>

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQHIGATE120 2</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ISNETMW0010\_ISNE</ETAG\_ID>

 <SUBMITTAL\_STATUS>SUCCESS</SUBMITTAL\_STATUS>

</SUBMITTAL\_RESPONSE>

**A3. Transaction with Pending eTag**

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>THROUGH</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.SALBRYNB345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SINK\_INTERFACE\_PNODE\_NAME>

 <ETAG\_ID>NBSO\_ISNETMW0013\_NYIS</ETAG\_ID>

 <RT\_DETAIL>

 <RT\_TRANSACTION\_TYPE>SELF SCHEDULED</RT\_TRANSACTION\_TYPE>

 <RT\_INTERVALS>

 <RT\_INTERVAL>

 <INTERVAL\_BEGIN>2019-05-04T11:00:00Z</INTERVAL\_BEGIN>

 <INTERVAL\_END>2019-05-04T24:00:00Z</INTERVAL\_END>

 <BID\_MW>10</BID\_MW>

 </RT\_INTERVAL>

 </RT\_INTERVALS>

 </RT\_DETAIL>

</TRANSACTION>

SUBMITTAL RESPONSE

<?xml version="1.0" encoding="UTF-8"?><SUBMITTAL\_RESPONSE xmlns="http://www.iso-ne.com/2018/nextt">

 <ISONE\_ID>4013514</ISONE\_ID>

 <CUSTOMER\_ID>12345</CUSTOMER\_ID>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.SALBRYNB345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SINK\_INTERFACE\_PNODE\_NAME>

 <ETAG\_ID>NBSO\_ISNETMW0013\_NYIS</ETAG\_ID>

 <SUBMITTAL\_STATUS>ACCEPTED WITH ERROR</SUBMITTAL\_STATUS>

 <TRANSACTION\_ISSUES>

 <ISSUE>

 <CODE>etag.status.pending</CODE>

 <SEVERITY>ERROR</SEVERITY>

 <MESSAGE>eTag ID referenced status is PENDING</MESSAGE>

 </ISSUE>

 </TRANSACTION\_ISSUES>

</SUBMITTAL\_RESPONSE>

**A4. Transaction with DA and RT on Non-PTF Interface and Market Options**

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQ\_P1\_P2345 5</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ABCDEOASIS12\_ISNE</ETAG\_ID>

 <RT\_DETAIL>

 <RT\_TRANSACTION\_TYPE>SELF SCHEDULED</RT\_TRANSACTION\_TYPE>

 <RT\_INTERVALS>

 <RT\_INTERVAL>

 <INTERVAL\_BEGIN>2019-05-03T21:00:00Z</INTERVAL\_BEGIN>

 <INTERVAL\_END>2019-05-03T23:00:00Z</INTERVAL\_END>

 <BID\_MW>10</BID\_MW>

 <BID\_PRICE>0.00</BID\_PRICE>

 </RT\_INTERVAL>

 </RT\_INTERVALS>

 <OASIS\_RESERVATIONS>

 <OASIS\_RESERVATION\_ID>123456</OASIS\_RESERVATION\_ID>

 </OASIS\_RESERVATIONS>

 <RT\_OPTIONS>

 <GIS\_ID>BA12345</GIS\_ID>

 </RT\_OPTIONS>

 </RT\_DETAIL>

</TRANSACTION>

SUBMITTAL RESPONSE

<?xml version="1.0" encoding="UTF-8"?><SUBMITTAL\_RESPONSE xmlns="http://www.iso-ne.com/2018/nextt">

 <CUSTOMER\_ID>12345</CUSTOMER\_ID>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQ\_P1\_P2345 5</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ABCDEOASIS12\_ISNE</ETAG\_ID>

 <SUBMITTAL\_STATUS>REJECTED</SUBMITTAL\_STATUS>

 <INTERVAL\_ISSUES>

 <INTERVAL\_ISSUE>

 <INTERVAL\_BEGIN>2019-05-03T21:00:00Z</INTERVAL\_BEGIN>

 <ISSUE>

 <CODE>general.price.not.allowed</CODE>

 <SEVERITY>FATAL</SEVERITY>

 <MESSAGE>Price is not allowed with Transaction Type selected: 0.0</MESSAGE>

 </ISSUE>

 </INTERVAL\_ISSUE>

 <INTERVAL\_ISSUE>

 <INTERVAL\_BEGIN>2019-05-03T22:00:00Z</INTERVAL\_BEGIN>

 <ISSUE>

 <CODE>general.price.not.allowed</CODE>

 <SEVERITY>FATAL</SEVERITY>

 <MESSAGE>Price is not allowed with Transaction Type selected: 0.0</MESSAGE>

 </ISSUE>

 </INTERVAL\_ISSUE>

 </INTERVAL\_ISSUES>

</SUBMITTAL\_RESPONSE>

# APPENDIX B. File Upload, Transaction Modification Examples

**B1. Example Modifying Header Data**

This example builds off Example A1. If and of the OUTSIDE\_REFERENCE\_NAME, OUTSIDE\_REFERENCE\_ID or IMPORT\_RESOURCE fields are not included, they will be removed from the transaction.

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <ISONE\_ID>4013509</ISONE\_ID>

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>NYIS\_ABCDE999999\_ISNE</ETAG\_ID>

 <IMPORT\_RESOURCE\_ID>12345</IMPORT\_RESOURCE\_ID>

</TRANSACTION>

**B2. Example modifying DA Details**

This example builds off B1. This submittal will change the MW and price for only the 5/5/2019 05:00 – 06:00 interval. All other intervals in the original file will be unchanged.

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <ISONE\_ID>4013509</ISONE\_ID>

 <OUTSIDE\_REFERENCE\_NAME>user determined</OUTSIDE\_REFERENCE\_NAME>

 <OUTSIDE\_REFERENCE\_ID>neighboring area ID</OUTSIDE\_REFERENCE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.ROSETON 345 1</SOURCE\_INTERFACE\_PNODE\_NAME>

 <ETAG\_ID>NYIS\_ABCDE033459\_ISNE</ETAG\_ID>

 <IMPORT\_RESOURCE>12345</IMPORT\_RESOURCE>

 <DA\_DETAIL>

 <DA\_TRANSACTION\_TYPE>UPTO CONGESTION</DA\_TRANSACTION\_TYPE>

 <UP\_TO\_CONGESTION\_LOCATION\_NAME>.Z.NEMASSBOST</UP\_TO\_CONGESTION\_LOCATION\_NAME>

 <DA\_INTERVALS>

 <DA\_INTERVAL>

 <INTERVAL\_BEGIN>2019-05-05T05:00:00Z</INTERVAL\_BEGIN>

 <INTERVAL\_END>2019-05-05T06:00:00Z</INTERVAL\_END>

 <BID\_MW>50</BID\_MW>

 <BID\_PRICE>5.55</BID\_PRICE>

 </DA\_INTERVAL>

 </DA\_INTERVALS>

 </DA\_DETAIL>

</TRANSACTION>

**B3. Example modifying OASIS**

If all that is changing is the OASIS information, then the RT\_INTERVALS section is not required, only the OASIS section needs to be included.

In this example, the OASIS reservation in the existing transaction is replaced by reservation 656565

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <ISONE\_ID>111111</ISONE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQ\_P1\_P2345 5</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ABCDEOASIS12\_ISNE</ETAG\_ID>

 <RT\_DETAIL>

 <RT\_TRANSACTION\_TYPE>SELF SCHEDULED</RT\_TRANSACTION\_TYPE>

 <OASIS\_RESERVATIONS>

 <OASIS\_RESERVATION\_ID>656565</OASIS\_RESERVATION\_ID>

 </OASIS\_RESERVATIONS>

 </RT\_DETAIL>

</TRANSACTION>

In this example another reservation is added to the previous transaction. BOTH reservations must be present and listed in the order desired for MW assignment on the transaction. Reservation 656565 will be applied first, then reservation 767676 will be applied.

SUBMITTAL FILE

<?xml version="1.0" encoding="UTF-8"?>

<TRANSACTION xmlns="http://www.iso-ne.com/2018/nextt" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

 <ISONE\_ID>111111</ISONE\_ID>

 <RESPONSIBLE\_CUSTOMER\_ID>12345</RESPONSIBLE\_CUSTOMER\_ID>

 <DIRECTION>IMPORT</DIRECTION>

 <SOURCE\_INTERFACE\_PNODE\_NAME>.I.HQ\_P1\_P2345 5</SOURCE\_INTERFACE\_PNODE\_NAME>

 <SINK\_INTERFACE\_PNODE\_NAME xsi:nil="true"/>

 <ETAG\_ID>HQT\_ABCDEOASIS12\_ISNE</ETAG\_ID>

 <RT\_DETAIL>

 <RT\_TRANSACTION\_TYPE>SELF SCHEDULED</RT\_TRANSACTION\_TYPE>

 <OASIS\_RESERVATIONS>

 <OASIS\_RESERVATION\_ID>656565</OASIS\_RESERVATION\_ID>

 <OASIS\_RESERVATION\_ID>767676</OASIS\_RESERVATION\_ID>

 </OASIS\_RESERVATIONS>

 </RT\_DETAIL>

</TRANSACTION>

# APPENDIX C. Sample of Programmatic Processing

This appendix is provided as an example of how the programmatic actions can be implemented. It is expected that a user is familiar with these protocols; this is not intended as a guide for someone that is not familiar with these technologies.

A user will need to write code to collect the certificate and trust key store information, the request to be made and the command to be executed. In the example below java is used for this process, creating a JAR file. In the java code below, the certificate and trustkey store are read in from a configuration file. If the file is located elsewhere the full descriptive URL must be included.

**Sample JAVA CODE**

package com.isone.nextt;

import java.io.BufferedInputStream;

import java.io.File;

import java.io.FileInputStream;

import java.io.InputStream;

import java.nio.file.FileSystems;

import java.nio.file.Files;

import java.nio.file.Path;

import java.security.KeyStore;

import java.util.Properties;

import javax.net.ssl.SSLContext;

import org.apache.http.client.methods.CloseableHttpResponse;

import org.apache.http.client.methods.HttpGet;

import org.apache.http.client.methods.HttpPost;

import org.apache.http.client.methods.HttpPut;

import org.apache.http.conn.ssl.NoopHostnameVerifier;

import org.apache.http.entity.StringEntity;

import org.apache.http.impl.client.CloseableHttpClient;

import org.apache.http.impl.client.HttpClients;

import org.apache.http.ssl.SSLContextBuilder;

import org.apache.http.util.EntityUtils;

public class NexttClient {

 private KeyStore loadKeyStore(File keyStoreFile, char[] keyStorePassword, String keyStoreType) throws Exception {

 KeyStore keyStore = null;

 keyStore = KeyStore.getInstance(keyStoreType);

 InputStream keyStoreStream = new BufferedInputStream(new FileInputStream(keyStoreFile));

 keyStore.load(keyStoreStream, keyStorePassword);

 keyStoreStream.close();

 return keyStore;

 }

 private SSLContext loadSSLContext() throws Exception {

 Properties properties = new Properties();

 File conf = new File("certificates/https.properties");

 properties.load(new FileInputStream(conf));

 String keystoreFile = properties.getProperty("keyStore");

 String keyPassword = properties.getProperty("keyStorePassword");

 String keyStoreType = properties.getProperty("keyStoreType");

 String directory = conf.getAbsoluteFile().getParent();

 File keyStore = new File(directory, keystoreFile);

 KeyStore keystore = loadKeyStore(keyStore, keyPassword.toCharArray(), keyStoreType);

 SSLContext sslContext = new SSLContextBuilder().loadTrustMaterial(null, (certificate, authType) -> true)

 .loadKeyMaterial(keystore, keyPassword.toCharArray())

 .build();

 return sslContext;

 }

 private CloseableHttpResponse doGET(CloseableHttpClient httpClient, String url) throws Exception {

 System.out.println("GET from URL: " + url);

 HttpGet httpGet = new HttpGet(url);

 return httpClient.execute(httpGet);

 }

 private CloseableHttpResponse doPOST(CloseableHttpClient httpClient, String url, String postXml) throws Exception {

 HttpPost httpPost = new HttpPost(url);

 httpPost.setHeader("Content-type", "application/xml");

 StringEntity entity = new StringEntity(postXml);

 httpPost.setEntity(entity);

 return httpClient.execute(httpPost);

 }

 private CloseableHttpResponse doPUT(CloseableHttpClient httpClient, String url, String putXml) throws Exception {

 HttpPut httpPut = new HttpPut(url);

 httpPut.setHeader("Content-type", "application/xml");

 StringEntity entity = new StringEntity(putXml);

 httpPut.setEntity(entity);

 return httpClient.execute(httpPut);

 }

 public static void main(String[] args) throws Exception {

 NexttClient nexttClient = new NexttClient();

 SSLContext sslContext = nexttClient.loadSSLContext();

 CloseableHttpClient httpClient = HttpClients.custom()

 .setSslcontext(sslContext)

 .setSSLHostnameVerifier(new NoopHostnameVerifier())

 .build();

 String method = args[0];

 String url = args[1];

 CloseableHttpResponse response = null;

 if (method.equals("GET")) {

 response = nexttClient.doGET(httpClient, url);

 } else if (method.equals("POST")) {

 String postFileName = args[2];

 Path path = FileSystems.getDefault().getPath(postFileName);

 String xml = new String(Files.readAllBytes(path));

 response = nexttClient.doPOST(httpClient, url, xml);

 } else if (method.equals("PUT")) {

 String putFileName = args[2];

 Path path = FileSystems.getDefault().getPath(putFileName);

 String xml = new String(Files.readAllBytes(path));

 response = nexttClient.doPUT(httpClient, url, xml);

 } else {

 System.out.println("Only accept HTTP: GET,POST,PUT");

 }

 if (response != null) {

 System.out.println("");

 System.out.println("Response code: " + response.getStatusLine());

 String responseString = EntityUtils.toString(response.getEntity(), "UTF-8");

 System.out.println(responseString);

 response.close();

 }

 }

}

**Certificate configuration file**

Below is the content that should be included in the certificate configuration file.

keyStore=ATTTestUser.p12

keyStorePassword=xxxxxx

keyStoreType=PKCS12

trustkeyStore=\*\*\*\*.jks

trustkeyStorePassword=xxxxx

trustkeyStoreType=jks

**Examples of Implementation**

In these examples, the certificate and file to be upload are located in the same directory as the jar file. If that is not the case, the full path would need to be referenced.

Submit Transaction

Note: the filename needs to be quoted because of the space in the filename

java -jar nextt-client-jar-with-dependencies.jar POST https://smd.iso-ne.com/nextt/api/transactions “new transaction.xml” > output1.xml

Update Transaction

Note: Tnx 4001219

java -jar nextt-client-jar-with-dependencies.jar PUT https:// smd.iso-ne.com/nextt/api/transactions/4001219 tnx\_update.xml > output2.xlm

Query one Transaction

Note: Tnx 4001219

java -jar nextt-client-jar-with-dependencies.jar GET https:// smd.iso-ne.com/nextt /api/transactions/4001219

Query list of Tnx

Note: the URL needs to be quoted because of & in URL

java -jar nextt-client-jar-with-dependencies.jar GET " https:// smd.iso-ne.com/nextt /api/transactions?startdate=20180201&enddate=20180201"

# APPENDIX D. Error Codes

| **ERROR CODE** | **SEVERITY LEVEL** | **ERROR DESCRIPTION** |
| --- | --- | --- |
| deadline.da | FATAL | DayAhead Market Deadline is violated |
| deadline.rt | FATAL | Realtime Market Deadline is violated |
| deadline.rt.oasis.update | FATAL | Realtime Market Deadline is violated to update OASIS reservation |
| deadline.rt.option.update | FATAL | Realtime Market Deadline is violated to update Options |
| deadline.rt.priced | FATAL | Realtime Market Deadline for PRICED transaction is violated |
| deadline.rt.priced.mw.update | FATAL | Cannot add or increase RT Priced Transaction MW after DAM deadline  |
| deadline.rt.priced.price.update | FATAL | Cannot change RT Transaction Price after DAM deadline, except in reOffer window |
| deadline.rt.set.excepted | FATAL | Realtime Market Deadline is violated to add Excepted option  |
| deadline.rt.set.grandfathered | FATAL | Realtime Market Deadline is violated to add Grandfathered option |
|   |   |   |
| etag.invalid.format | FATAL | Invalid eTag ID format {0} |
| etag.invalid.path\* | FATAL | eTag ID referenced and transaction have different path |
| etag.invalid.dir | FATAL | eTag ID referenced and transaction have different direction |
| etag.invalid.status\* | FATAL | eTag ID referenced does not have a valid status {0} |
| etag.mw.overuse | ERROR | Transaction MW exceed eTag MW  |
| etag.not.exist | ERROR | eTag ID referenced does not exist at OATI |
| etag.not.present | FATAL | eTag ID required to submit transaction |
| etag.reuse | FATAL | eTag ID referenced cannot be reused for 12 months |
| etag.status.pending | ERROR | eTag ID referenced status is PENDING |
| etag.test.tag | FATAL | eTag ID is associated with a Test Tag |
| etag.tnx.oasis.mismatch | ERROR | eTag ID referenced and transaction have different OASIS |
|   |   |   |
| general.ca.emergency.invalid | FATAL | Transactions for Non ISO-NE company can't have CA Emergency option |
| general.customer.missing | FATAL | Customer Object is null or Customer ID is missing |
| general.customer.not.active | FATAL | Only Active Customer can submit a transaction |
| general.customer.not.participant | FATAL | Only PARTICIPANTS can submit EXPORT or IMPORT transactions |
| general.da.data.invalid | FATAL | DA data provided without DA TYPE |
| general.da.interval.required | FATAL | DA Transaction needs DA interval |
| general.direction.missing | FATAL | Must specify Direction |
| general.export.sink | FATAL | EXPORT must specify SINK |
| general.export.source | FATAL | Only SINK required for EXPORT |
| general.import.sink | FATAL | Only SOURCE required for IMPORT |
| general.import.source | FATAL | IMPORT must specify SOURCE |
| general.isone.ca.emergency.only | FATAL | Transactions for ISO-NE company must have an option selected |
| general.market.type.required | FATAL | DA Type or RT Type required |
| general.mw.all.zero | FATAL | MW value can't be all zero on new submit |
| general.mw.integer | FATAL | MW value must be integer: {0} |
| general.mw.range | FATAL | MW value must be >=0 and <= 999 MW: {0} |
| general.mw.required | FATAL | MW required |
| general.price.decimal | FATAL | Price can only have two decimals: {0} |
| general.price.not.allowed | FATAL | Price is not allowed with Transaction Type selected: {0} |
| general.price.range | FATAL | Price outside valid range: {0} |
| general.price.required | FATAL | Price required with Transaction Type selected |
| general.range.invalid | FATAL | Duration must be less than 31 days |
| general.rt.cts.not.allowed | FATAL | RT transaction on CTS interface must be submitted to NYISO JESS, not ISO-NE NEXTT |
| general.rt.data.invalid | FATAL | RT data provided without RT TYPE |
| general.start.invalid | FATAL | Start date must be less than 10 days in the future |
| general.subaccount.invalid | FATAL | Invalid subaccount |
| general.through.not.da | FATAL | THROUGH cannot be in DAM |
| general.through.rt.ss | FATAL | THROUGH must be RT SELF SCHEDULED |
| general.through.same.ca | FATAL | SOURCE and SINK cannot be in the same control area |
| general.through.sourcesink | FATAL | THROUGH requires SOURCE and SINK |
| general.transaction.immutable.change | FATAL | {0} cannot be modified |
| general.transaction.invalid.update | FATAL | invalid update {0} |
| general.transaction.missing | FATAL | Transaction can't be null |
| general.transaction.notfound | FATAL | Transaction not found, or not belong to customer.  |
| general.uptocongestion.invalid | FATAL | Up-To Congestion Location not valid with DA TYPE selected |
| general.uptocongestion.required | FATAL | Up-To Congestion Location required with DA TYPE selected |
|   |   |   |
| oasis.invalid.customer | FATAL | The company submitting the transactions must be owner of the OASIS reservations, unless ISO-NE has been noticed of other authorized use  |
| oasis.invalid.path | FATAL | OASIS reservation {0} path does not match transaction |
| oasis.invalid.status | ERROR | OASIS reservation {0} does not have a valid status: {1} |
| oasis.mw.overuse | ERROR | OASIS reservation referenced does not cover the transaction MW submitted |
| oasis.not.allowed.da | FATAL | OASIS are not allowed on transactions submitted to only the DAM |
| oasis.not.exist | ERROR | OASIS reservation {0} does not exist |
| oasis.not.present | FATAL | The required number of OASIS reservations are not provided |
| oasis.not.required.ptf | FATAL | OASIS is not required on PTF interface |
| oasis.required.nonptf | ERROR | OASIS is required on nonPTF interface: {0} |
|   |   |   |
| option.ca.emergency | FATAL | Criteria for use of this option is not satisfied |
| option.ca.emergency.mw | FATAL | CA Emergency bid mw must be zero |
| option.excepted.not.allowed | FATAL | There are no Excepted Transactions defined in the Tariff, this option is not valid |
| option.excepted.rttype.ss | FATAL | Excepted Transaction must be Self Scheduled |
| option.grandfathered.oasis | FATAL | Grandfathered Transaction must have MGTSA reservation |
| option.grandfathered.rttype.ss | FATAL | Grandfathered Transaction must be Self Scheduled |
| option.importresource.direction | FATAL | Direction Must be IMPORT for Import Resource |
| option.importresource.mw.overuse | ERROR | Import Resource MW are overused |
| option.importresource.not.found | FATAL | Import Resource ID was not found |
| option.lscc.noncsoexport.both | FATAL | LSCC Export Must also check Non-CSO Export, and reference to the same Asset   |
| option.lsccexport.asset.not.found | FATAL | Reference generator does not have known delist through FCA |
| option.lsccexport.csc | FATAL | LSCC Export must be on CSC Interface |
| option.lsccexport.da.rt | FATAL | LSCC Export must have both DA and RT MW |
| option.lsccexport.direction | FATAL | LSCC Export must be Export |
| option.lsccexport.mw.overused | ERROR | Mw exceeds export delist bid for referenced generator |
| option.noncsoexport.asset.not.found | ERROR | Reference generator does not have known obligation with neighbor, contact ISO |
| option.noncsoexport.direction | FATAL | This option must be Export |
| option.noncsoexport.mw.overuse | ERROR | MW exceeds Non-CSO MW on referenced generator |
| option.unconstrained.noncsoexport.both | FATAL | Unconstrained Export must also check Non-CSO Export, and reference to the same asset |
| range.add.rt.to.da | FATAL | When add RT to DA-ONLY transaction, the added RT interval must be within original DA start/stop range. |
|   |   |   |
| xml.invalid.schema | FATAL | Invalid XML schema uploaded |
| xml.invalid.interval.begin | FATAL | IntervalBegin must be on HourBegin: {intervalbegin} |
| xml.invalid.interval.end | FATAL | IntervalEnd must be on HourEnding: {intervalend} |
| xml.invalid.interval.range | FATAL | Invalid interval range: IntervalBegin {intervalbegin}, IntervalEnd {intervalend} |
| xml.invalid.interval.rt | FATAL | Cannot specify RT interval status, RT cleared attributes |
| xml.invalid.da | FATAL | Cannot specify DA status |
| xml.invalid.interval.da | FATAL | Cannot specify DA cleared attributes |
| xml.overlap.interval.rt | FATAL | RT interval overlap |
| xml.overlap.interval.da | FATAL | DA interval overlap |