Congestion Revenue Rights (CRR) Upgrade Project
Customer Partnership Group

April 17, 2025   *10:00 a.m.–11:00 a.m. (Pacific Time)*

Web Conference and New Meeting Information
Starting February 2025 and moving forward - WebEx details for each meeting can be found at the notice or [ISO calendar](). Participating in the monthly CRR Customer Partnership Group (CPG) forum. All calls are scheduled through the end of the year and a notice will provide the latest call-in details for each meeting.
Calls and webinars are recorded for stakeholder convenience, allowing those who are unable to attend to listen to the recordings after the meetings. The recordings will be publicly available on the ISO web page for a limited time following the meetings. The recordings, and any related transcriptions, should not be reprinted without the ISO's permission.
To review previous materials, please click link below: https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group

Housekeeping reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- This collaborative meeting is intended to stimulate open dialogue and engage different perspectives.

- Please keep comments professional and respectful.

- Please try and be brief and refrain from repeating what has already been said so that we can manage the time efficiently.

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Instructions for raising your hand to ask a question

- Open the Participant and Chat panels from the bottom right corner of your screen.

- If you are connected to audio through your computer or used the "call me" option, select the raise hand icon ✋ located at the bottom of the participant panel.
  -Note: press *3 to get into the question queue if you dialed into the meeting.

- Please remember to state your name and affiliation before making your comment.

- If you need technical assistance during the meeting, please send a chat to the event producer.

- You may also send your question via chat to either Hannah Pearson or to all panelists.

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Agenda

Time (PST)	Topic
10:00 – 10:05	Welcome
10:05 – 10:10	CRR Upgrade Project timeline Update
10:10 – 10:30	Market Sim and Cutover plans
10:30 – 10:40	Questions and Next steps

CRR System Upgrade – Project Update & Timeline
Last Updated April 2025

1. Business Unit verified Model Builder and their UAT is ready for go live

2. Provisioning for production now set up in AIM

3. Load & performance and credit/supplement/invoicing testing continue. Data migration activities are underway

4. Targeting to have July be the first month with processes fully on the new system
   - Targeting v0 model build for 5/23/25 for July on new System
   - Posting updated calendar by 4/18/25

5. Will not have Cutover on 4/30/25. Target is 5/22/25 for Cutover

6. Target to complete Stage Load & Performance and UAT testing in April

7. Next CPG 5/1/25, to provide next update

8. Refresher Training – see next slide

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CRR Refresher Training Dates/Times

Notice will be sent in the afternoon of April 17, 2025. Locate details on CAISO Website > [Daily Briefing](#)

CRR Holders   [Monday April 28, 2025 from 9:00am-11:00am PST](#)

CRR LSEs   [Monday April 28, 2025 from 1:00pm-3:00pm PST](#)

CRR UDCs   [Tuesday April 29, 2025 from 9:00am-10:00am PST](#)

Please submit any questions you might have prior to the training here: https://www.surveymonkey.com/r/CAISOreleasetrainingquestions

Production AIM Provisioning

As of 4/02/2025, CRR Holders and/or Load-Serving Entities that were provisioned in AIM as:

- **EXTERNAL MUI USER WITH NDA** or
- **EXTERNAL MUI RESTRICTED WITHOUT NDA**

The ISO has provisioned/migrated their access to:

- **EXTERNAL CRR HOLDER READ/WRITE ACCESS**

As of 4/03/2025, CRR NDA Users that were provisioned in AIM as:

- **CRRFNM EXTERNAL READ-ONLY** or
- **EXTERNAL MUI USER WITH NDA**

Then the ISO has provisioned/migrated their access to:

- **EXTERNAL CRR NDA REPORTS READ-ACCESS**

Please note: Any **new user** who needs provisioning to the new CRR system after the migration cut-off dates above, UAAs will need to provision them to any of the applicable new roles.

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Production AIM Provisioning cont.

Beginning on 4/14/2025, UAAs can provision their users in AIM to any of the upgraded CRR system Production environment new roles:

- **EXTERNAL CRR HOLDER READ/WRITE ACCESS**
- **EXTERNAL CRR HOLDER READ ACCESS**
- **EXTERNAL CRR NDA REPORTS READ-ACCESS**

Please note: These roles follow the existing CRR Holder participation registration process and CRR ISO Non-Disclosure Agreement process.

Cutover Plan and BRS links

Business Requirements Specifications v1.7 - Congestion Revenue Rights System Upgrade

Cutover Plan: https://www.caiso.com/documents/2025-monthly-and-2026-annual-allocation-and-auction-calendar.pdf

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OPEN DISCUSSION AND QUESTIONS

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Next Steps

- Next meeting is tentatively scheduled for Thursday May 1, 2025 @10:00am, will be confirmed via notice.

- Please contact Hannah Pearson at Hpearson@caiso.com or ISOStakeholdersaffairs@caiso.com with any questions.

- General questions regarding market simulation, contact marketsim@caiso.com. For training questions, contact CustomerReadiness@caiso.com.

- Specific issues or questions regarding the CRR System Upgrade project, please submit a CIDI ticket with the subject "<Project Name>: <System Name> - <Issue Title>" with the functional environment associated.

- Visit CPG webpage for more information: https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group

- ***Starting February 2025 and moving forward*** - WebEx details for each meeting can be found at the notice or ISO calendar.

- Participating in the monthly CRR Customer Partnership Group (CPG) forum. All calls are scheduled through the end of the year and a notice will provide the latest call-in details for each meeting.
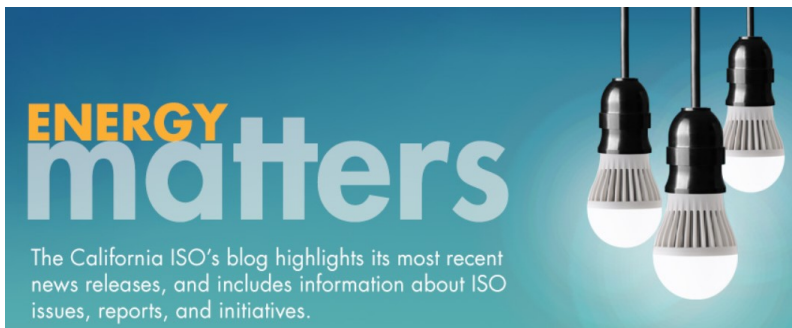
Energy Matters blog provides timely insights into ISO grid and market operations as well as other industry-related news.
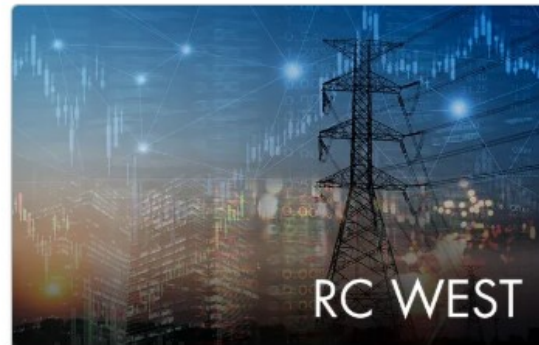
https://www.caiso.com/about/news/energy-matters-blog

Story | Operations

A small distributed energy resources project that could have a big impact

By ISO Staff

03/10/2025

Story | Transmission

Spring is the season of managing planned maintenance for RC West
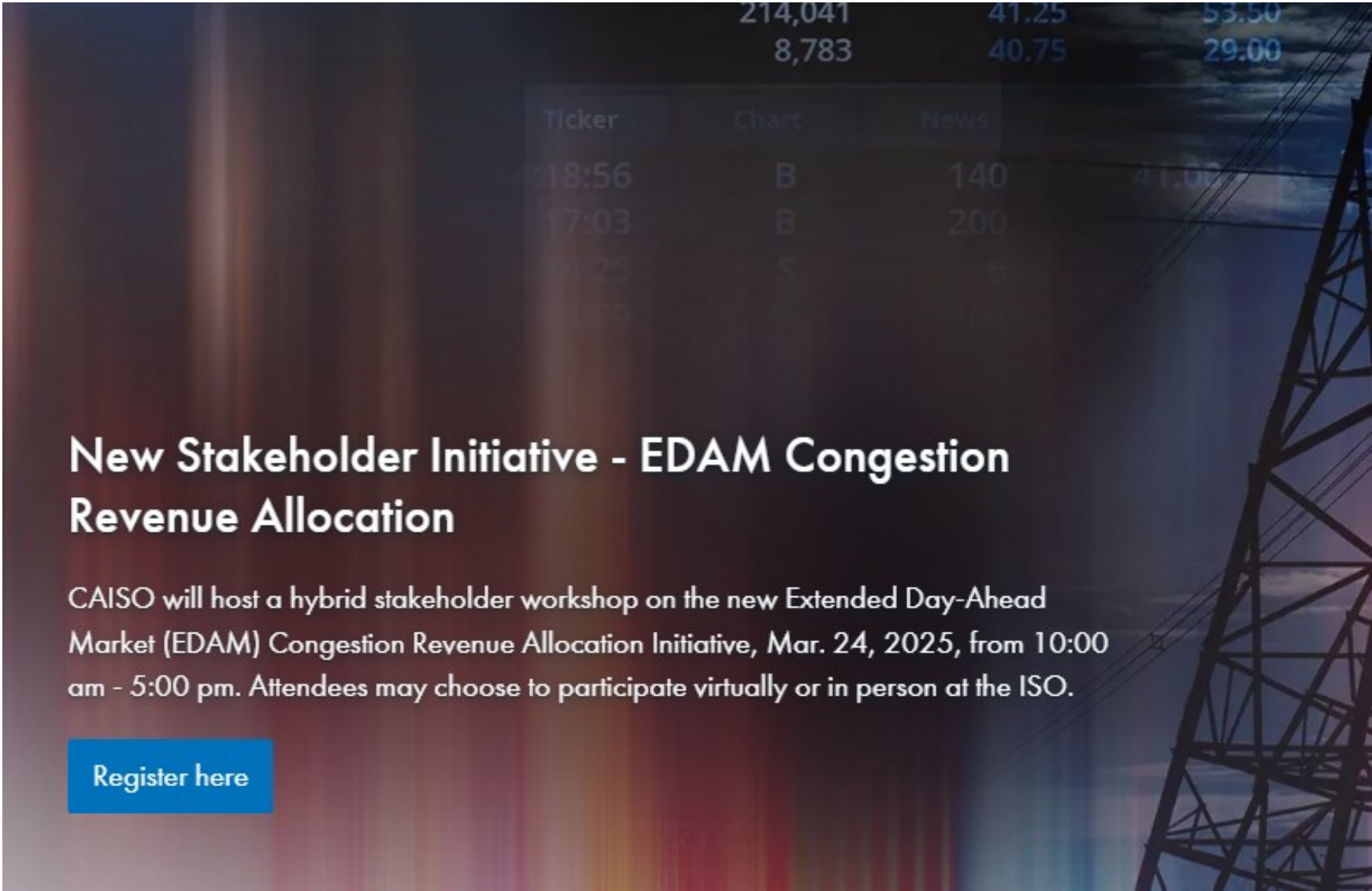
By Raja Thappetaobula

03/05/2025

Story | Leadership

Another year of new challenges and opportunities at CAISO

By Severin Borenstein

02/27/2025

Subscribe to Energy Matters blog monthly summary

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New Stakeholder Initiative - EDAM Congestion Revenue Allocation

CAISO will host a hybrid stakeholder workshop on the new Extended Day-Ahead Market (EDAM) Congestion Revenue Allocation Initiative, Mar. 24, 2025, from 10:00 am - 5:00 pm. Attendees may choose to participate virtually or in person at the ISO.

Register here

[Click here to register](#)

REFERENCE SLIDES

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MapStage AIM Provisioning

- For CRR Holders and Load-Serving Entities that are currently provisioned in AIM as:
  - **EXTERNAL MUI USER WITH NDA or**
  - **EXTERNAL MUI RESTRICTED WITHOUT NDA**
- The ISO will provision/migrate access to:
  - **EXTERNAL CRR HOLDER READ/WRITE ACCESS**

- For CRR NDA Users that are currently provisioned as:
  - **CRRFNM EXTERNAL READ-ONLY or**
  - **EXTERNAL MUI USER WITH NDA**
- The ISO will provision/migrate their access to:
  - **EXTERNAL CRR NDA REPORTS READ-ACCESS**

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MapStage AIM Provisioning

- If you have new users that need to be provisioned for testing, please make sure you provision them to any of these new roles:
  - **EXTERNAL CRR HOLDER READ/WRITE ACCESS** or

    EXTERNAL CRR HOLDER READ ACCESS

    (both above follows the existing CRR Holder participant registration process)
  - **EXTERNAL CRR NDA REPORTS READ-ACCESS**

    (follows the existing CRR ISO Non-Disclosure Agreement process)

CRR – B2B Spec Updates

Spec File	Changes
caiso_crr_historical_forecasted_load_v1.1.1.yaml	- Added error code SEC0002 for invalid participant name
caiso_crr_load_migration_v1.3.1.yaml	- Added error code SEC0002 for invalid participant name - Added error code LMV1003 for the specified load migration market name does not exist in the system
caiso_crr_secondary_market_v1.2.1.yaml	- Added error code SEC0002 for invalid participant name - Added error code SMT0016 for nonexistence of request ID in the system - Added error code SMT0063 for mismatched asset owner of specified request and participant name - Added error code SMT0145 when price in the response does not match price in the corresponding offer - Correct description of error code SMT0082 to "Unable to retrieve a secondary market record by the given request ID and participant name."
caiso_crr_tor_conversion_v1.2.1.yaml	- Remove Start Date and End Date from ConversionApprovalRecord to be consistent with MUI TOR Conversion Approval Editor - Added error code SEC0002 for invalid participant name - Modified description of error code TOR0016 for nonexistence of TOR conversion window name in the system
caiso_crr_messages_v1.2.1.yaml	- Added error code SEC0002 for invalid participant name

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CRR – JSON Schema Update

Schema Name	Changes
CRRHistoricalForecastLoad_v1.0.2.draft-07.schema	- Corrected time in date example to '2025-07-01T**07**:00:00Z'

CRR MUI CSV Templates, API Connectivity Guidance

Developer Site https://developer.caiso.com

Apps > CRR > Release Notes
    (1) CRR v4.x.x MUI Upload CSV Template for MP DRAFT.zip
        CSV Template for MP_draft

CRRH Only	CLSE/CRRH	CUDC	TOR	CEC
• CRR bids/Offers • Secondary market	• CRR nominations • CRR bids/Offers • Historical and forecasted load • Secondary market • LT Nomination Election • MT_TOR CRR Approvals	• Customer rate (once a year) • Customer number • DASR	• TOR Conversion Request	• Load data - no change

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CRR MUI CSV Templates, API Connectivity Guidance

Developer Site https://developer.caiso.com

Apps > CRR > Release Notes

(2) CRR v4.x.x API Connectivity.zip

CRR_APIConnectivitySoapUI_v1.0.xml: SoapUI project

CRRv4.x.x.APIConnectivity.pdf: Contains information about the API testing tool (SoapUI) request and responses for CRR B2B API connectivity testing purposes

Purpose

This document is an accompaniment to the CRR v4.x.x. Application Programming Interface (API) connectivity/sample SoapUI project <CRR_APIConnectivitySoapUI_v1.0.xml>; which is comprised of a subset of CRR endpoints' screenshots, illustrating its respective request and response.

Market participants may utilize the provided SoapUI project to confirm initial integration with the CRR application via APIs manually, such that:

API submissions can successfully connect to CRR endpoints and servers, with a valid return response code

Verifying that the API authenticates and authorizes user to access the CRR application

Pre-requisites/Dependencies

Market participants who would utilize the SoapUI project would need:

SoapUI 5.7.2, to import the project

Valid ISO certificate and correct user access role provisioned

To execute the API requests within the same network as where your system API calls would be coming from

API Connectivity Checklist

The provided SoapUI project contains one POST and/or GET method sample for each of the ten (10) RESTful CRR v4.x.x services available.

Please refer to the ISO Developer Portal CRR application page for the comprehensive/complete endpoint service definitions per API.

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CRR Service Endpoint Details

#	Service	GET	POST	Likelihood that file submission may be greater than > 1 MB filesize	CRR System (UI / API)
1	CRR Historical & Forecasted Load	x	x	Yes	Phase 1: Use UI for submission for now, no API available Phase 2: API submission pattern - TBD
2	CRR Auction	x	x	Yes	Maximum 500 recs for any file submission to the system 20 bid segments per bid (business rule)
3	CRR Load Migration	x	x	No	-
4	CRR Nomination	x	x	Yes	Maximum 500 recs for any file submission to the system
5	CRR Secondary Market	x	x	No	Maximum 500 recs for any file submission to the system

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CRR Service Endpoint Details

#	Service	GET	POST	Potential submission for >1mb filesize	Comments
1	CRR App Status	x			
2	CRR Market Data	x	n/a	n/a	Only retrieve data, no submission
3	CRR Market Status	x			
4	CRR Messages	x			

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RECAP: CRR Upgrade Project - Overview

- The ISO has decided to upgrade the existing CRR system with a new system that adopts the latest technology stack aligned with the ISO's technology standards, consolidates all CRR related functions, minimizes human errors, reduces processing time, eliminates manual workarounds, and positions the system to accommodate policy changes down the road.

- This on-going Customer Partnership Group (CPG) will provide an overview of the schedule, review of external BRS and answer questions. Subsequent meetings will include detailed review and discussion of business process changes impacting market participants.

- http://www.caiso.com/Documents/BusinessRequirementsSpecification_CongestionRightsRevenueUpgrade.pdf

- The goal of this CPG is to ensure customer readiness as this project deploys to Production in 2024.

RECAP: CRR Upgrade Project – Overview of changes

- **Load submission process**
    - At the time of load submission participant will be notified of any failed validation per sink location based on the exceedance load and allow to resubmit

- **OBAALSE process**
    - EQ load election will be submitted through the UI during the OBAALSE load submission

- **Consolidate data publishing in MUI and/or OASIS**
    - Calendar: change from webpost to OASIS
    - Model data: change from webpost to MUI, including both NDA and non NDA files
    - Market Result data: from webpost to MUI

- **Modeling data**
    - Powerflow case to be released in PSSE v30
    - ITC definition will be modeled as source and sink

- **Features added to enable user performing additional tasks**
    - MT_TOR: user to submit through UI, currently performed by CRR group

- **Changes to Load Migration and Source and Sink processes**

- **User access**
    - User will be provisioned to specific functions within the system, based on the application access request approval process

- **Webservices interface for interacting with MUI**

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Market Sim - Overview

- Market participant training will complete prior to last week of connectivity, and one week before start of Market Sim
- 4 weeks connectivity
  - Week two CAISO will provide ability for allocation and auction API upload
  - No functionality will be available to test until the start of Market Sim
- 3 week structured scenario execution
- 2 week unstructured
- CAISO will request all interested CRR market participants sign up to participate in Market Sim
- All current user profiles will be migrated into Map-stage for Market Sim, new participants will need to request to be provisioned

RECAP: CRR Upgrade Project– Overview of changes cont.

- **Source and Sink list release**
  - Remove the existing 30 days ahead of allocation version
  - Will be released in v0, v1 and other updates within the active market period

- **Retired resource mapping**
  - Re-map the retired PNode to the closest electrically connected PNode that is also a biddable location in the CRR processes and has the same source/sink designation as the retired location
  - Baseloading CRR will be mapped based on the model used in the active market period to capture the most accurate topology
  - Mapping will be released for the corresponding market period

- **Source and Sink islanded by outage**
  - With baseloading CRR, sell offer allowed
  - No baseloading CRR, will not be biddable for the effective market

CAISO B2B Improvements – Goals & Current Status

- **Goals**
    - Enhance the developer experience working with CAISO Web API's
    - Provide API's in REST/JSON using OpenAPI 3.0 specification
    - Provide examples, mock services and tooling to generate client/server stubs and SDK
    - Provide tests for the API's using Postman collections
    - Collaboration using Git and forums on developer.caiso.com
    - Simplify authentication using mutual TLS and X.509 certificates

- **Update**
    - POC updates and notes and recording from meetings are posted on developer forum at https://developer.caiso.com/forum/topics.aspx?ForumID=4.
    - Documents uploaded to the Developer Forum: https://developer.caiso.com/forum/messages.aspx?TopicID=6119
        - PowerPoint presentation and webinar recording
        - Draft version of CRR Auction Service OpenAPI Specifications
        - Draft version of CRR business validate message bundle

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CAISO B2B Improvements – SOAP vs REST

SOAP

```
POST /GetStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml

<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap-
envelope"
soap:encodingStyle="http://www.w3.org/
2001/12/soap-encoding">

<soap:Body xmlns:m="http://www.example.org/
stock">
 <m:GetStockPrice>
  <m:StockName>IBM</m:StockName>
 </m:GetStockPrice>
</soap:Body>
</soap:Envelope>
```

REST

```
GET http://example.org/stock/IBM
```

- SOAP (Simple Object Access Protocol) provides the following advantages when compared to REST:
  - Language, platform, and transport independent (REST requires use of HTTP)
  - Works well in distributed enterprise environments (REST assumes direct point-to-point communication)
  - Standardized
  - Provides significant pre-build extensibility in the form of the WS* standards
  - Built-in error handling
  - Automation when used with certain language products
- REST (Representational State Transfer) is easier to use for the most part and is more flexible. It has the following advantages when compared to SOAP:
  - Uses easy to understand standards like swagger and OpenAPI Specification 3.0
  - Smaller learning curve
  - Efficient (SOAP uses XML for all messages, REST mostly uses smaller message formats like JSON)
  - Fast (no extensive processing required)
  - Closer to other Web technologies in design philosophy
  - As one REST API tutorial put it: SOAP is like an envelope while REST is just a postcard

https://www.soapui.org/learn/api/soap-vs-rest-api/

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CAISO B2B Improvements – CRR Developer Forum

https://developer.caiso.com/pages/application.aspx?app=CRR

RESTful services

Filter ▾

SERVICE	SPECIFICATION	DOCUMENTATION	STATUS	RELEASE	EFFEC
CRR Auction	crr_auction_1.0.0.yaml	crr_auction_1.0.0.html	NA	NA	NA
CRR Historical and Forecasted Load	crr_historical_and_forecasted_load_1.0.0.yaml	crr_historical_and_forecasted_load_1.0.0.html	NA	NA	NA
CRR Market Data	crr_market_data_1.0.0.yaml	crr_market_data_1.0.0.html	NA	NA	NA
CRR Market Status	crr_market_status_v1.0.0.yaml	crr_market_status_v1.0.0.html	NA	NA	NA
CRR Message	crr_message_1.0.0.yaml	crr_message_1.0.0.html	NA	NA	NA
CRR Nomination	crr_nomination_1.0.0.yaml	crr_nomination_1.0.0.html	NA	NA	NA
CRR Secondary Market	crr_secondary_market_1.0.0.yaml	crr_secondary_market_1.0.0.html	● PROD_LATEST	Spring 2020	NA
	crr_secondary_market_0.0.0.yaml	crr_secondary_market_0.0.0.html	● MAP_STAGE	DRAFT	NA
CRR Tor Conversion	crr_tor_conversion_1.0.0.yaml	crr_tor_conversion_1.0.0.html	NA	NA	NA

ⓘ About status

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CAISO CRR API Mock Services

https://mapstage-apimock.caiso.com/mocks?appname=crr
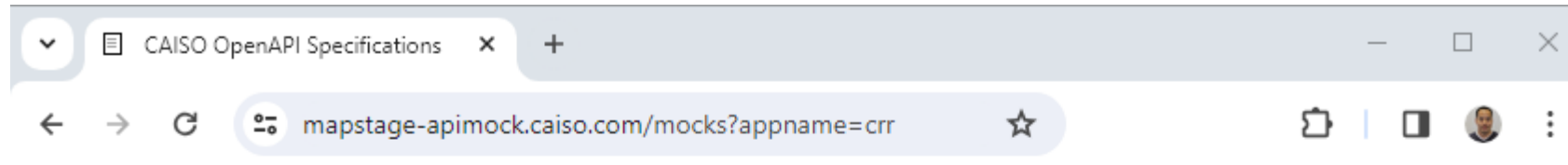
Specifications:

- mock_caiso_crr_auction_v1.0.0.html
- mock_caiso_crr_historical_and_forecasted_load_v1.0.0.html
- mock_caiso_crr_market_data_v1.0.0.html
- mock_caiso_crr_market_status_v1.0.0.html
- mock_caiso_crr_message_v1.0.0.html
- mock_caiso_crr_nomination_v1.0.0.html
- mock_caiso_crr_secondary_market_v1.0.0.html
- mock_caiso_crr_tor_conversion_v1.0.0.html

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CAISO B2B Improvements – Example: CRR Auction API

CAISO B2B Improvements – Free Swagger Editor Tool

https://editor.swagger.io/

CAISO B2B Improvements – New Web Services for CRR

Service	Operation
Allocation Nomination Portfolio	POST/GET
Auction Bid Portfolio	POST/GET
Historical and Forecasted Load	POST/GET
Existing CRRs (CRR Market Data)	GET
Market Data (CRR Market Data)	GET
Market Results (CRR Market Data)	GET
Private Allocation Results (CRR Market Data)	GET
Private Auction Results (CRR Market Data)	GET
Load Migration Data	POST/GET
Market Status (Market Info)	GET
CRR Messages	GET
Secondary Market	POST/GET
TOR Conversion	POST/GET

CAISO B2B Improvements – File Naming Convention

A2A/B2B OpenAPI File Naming Conventions for versioning:

File name example: **caiso_crr_market_info_v1.0.0_openapi.yaml**

Version Numbering Format: **MAJOR.MINOR.MINI**

MAJOR version of the file name will be incremented if there are any new services added or any major version update to any of the existing services

MINOR version of the file name will be incremented if there any minor version update to any of the existing services

MINI version of the file name will be incremented if there are only documentation changes/corrections, with no service changes.

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CAISO B2B Improvements

Each version update of the file name will reset the version numbers on the right

Version numbers will be tracked into the YAML file as part of the Release Notes

Example:
v1.0.0   File is published to market participants
v1.0.**1**   Edits were made to documentations, no functional changes
v1.0.**2**   Edits were made to documentations, no functional changes
v1.0.**3**   Edits were made to documentations, no functional changes
v1.**1**.0   Added a Minor version for a service
v1.1.**1**   Edits were made to documentations, no functional changes
v1.**2**.0   Added a Minor version for a service
v1.**3**.0   Added a Minor version for a service
v**2**.0.0   Added a Major version for a service
v2.0.**1**   Edits were made to documentations, no functional changes
v**3**.0.0   Added a new service

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