Congestion Revenue Rights (CRR) Upgrade Project
Customer Partnership Group

Aug 22, 2024   *10:00 a.m.–11:00 a.m. (Pacific Time)*

Web Conference Information	Conference Call Information
Web Address: https://caiso.webex.com/caiso/j.php?MTID=m4c62047c8ca3c36c50e2d1182518f8f9 Audio connection instructions will be available after connecting to the web conference. When prompted, select "Call me" and enter the phone number you will use during the call. You will be called by the conference shortly.	1-844-621-3956 United States Toll Free +1-650-479-3208 United States Toll Access code: 248 7236 5119 password: CRRCPG
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.	
https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group	

Instructions for raising your hand to ask a question

- If you are connected to audio through your computer or used the "call me" option, select the raise hand icon located on the top right above the chat window. Note: #2 only works if you dialed into the meeting.
  - Please remember to state your name and affiliation before making your comment.
 - You may also send your questions via chat to Brenda Marquez or to all panelists.

California ISO

Agenda

Time (PST)	Topic
10:00 – 10:05	Welcome
10:05 – 10:10	CRR Upgrade Project timeline Update
10:10 – 10:15	B2B Spec Updates
10:15 – 10:45	Market Sim and Cutover plans
10:45 – 11:00	Questions and Next steps

California ISO

CRR System Upgrade – Project Update & Timeline
Updated August 2024

- Functional Site Acceptance Testing, B2B integration and security testing continues
- Connectivity Testing – 1 week after above testing, starting in late October, just before Market SIM
- Training – 2 weeks before Market SIM in late October
- Market SIM - 2 week structured, then 3 week unstructured starting in early November
- 2025 Annual Cycle, carried out in 2024, will occur on the current Production CRR application
- *1 week Cutover to new CRR application 1/27/25 to 1/30/25- 2025*
- *March is first month with processes fully on the new system*
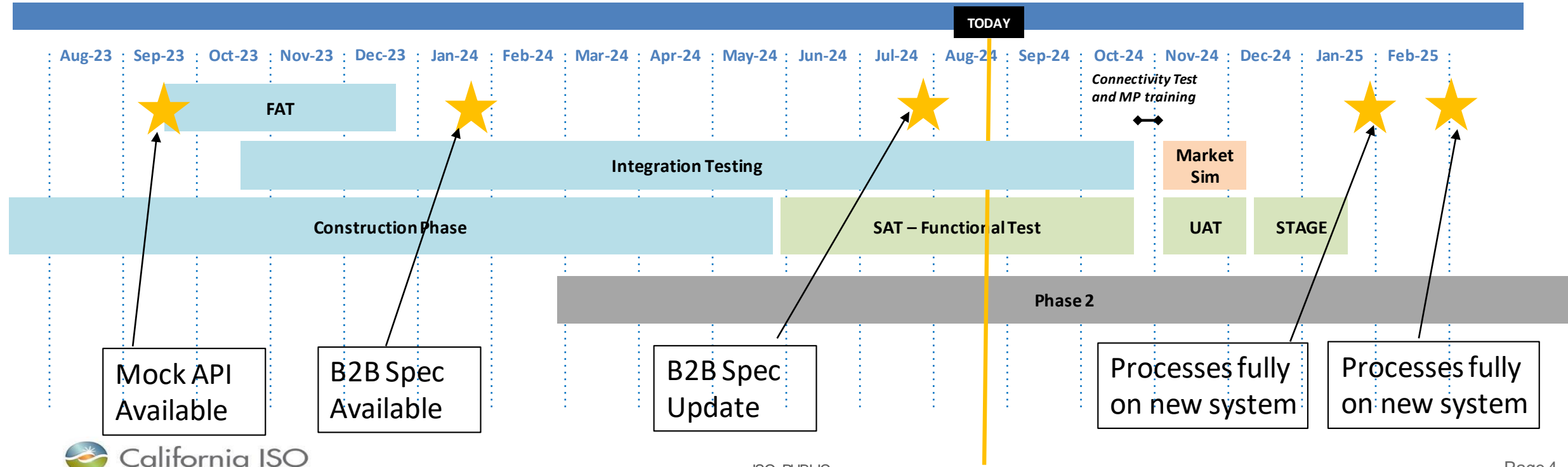
B2B Spec Update

- No B2B spec update at this time, but there will be updates on or before next CPG call

California ISO

Market Sim plan

- DRAFT - CRR 2024 & 2025 Allocation and Auction Markets Calendar
- Calendar layout of proposed CRR monthly and Annual Market Sim plan

Market Sim 2024

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY

week 1
T-2w - Connectivity
Prior to Market Sim - Kickoff and Overview
• Market Sim Plan
• High level overview of new system
• Uploading and Downloading
  ○ Manual Entry, File Upload, API
• Public/Private Downloads
• Messages
• Sorting and Filtering
• Documentation and Resources
• Contact Information
data setup of multiple markets
	Allocation Monthly Participants
	• Submit Nominations for Tier 1 Monthly Market (dummy MEQ)
	• Windows Close on Wednesday
	• Submit Historical/Forecast Load
	• Download Nomination Cap data
	• Download Allocation Market Results
	
	Market Sim Webex
		Auction Monthly Participants
		• Submit Auction Portfolios Monthly Auction Market
		  ○ Buy Bids, Sell Offers
		  ○ Credit - provide $10mil to all MPs for testing
		• Windows Close on Thursday
		• Download Auction Market Results
		
		Market Sim Webex
			Miscellaneous Monthly process
			• UDC Load Migration Submissions
			• CEC Load Forecast Submissions
			• LT Re-nomination
			• Secondary Market
			• MT_TOR CRR Approvals
			
			Market Sim Webex 3-4pm PST
				Reserved for CRR team data processing and participant responses
				
				Environment Patching

week 2
Reserved for CRR team data processing and participant responses
 	
CRR team setup for Monthly Mini Auction
	Allocation Annual Participants
	• Submit Nominations for Tier 1 Annual Market (dummy SEQ/UB/Signature Pair)
	
	Market Sim Webex
		Auction Annual Participants
		• Submit Auction Portfolios Annual Auction Market
		  • Buy Bids, Sell Offers
		  • Credit - provide $10mil to all MPs for testing
		• Re-submit for any processes or scenarios which had issues previously
			Miscellaneous Annual process
			• Submit Auction Portfolios for Participant requested scenarios
			• View results from Week 1 submissions
			
			Market Sim Webex
				Reserved for Q&A sessions, issue reporting, etc.
				
				Environment Patching

California ISO

Market Sim 2024

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
week 3 **Unstructured Week 1**	**Unstructured** • Re-submit for any process of scenarios for customer specific testing **Market Sim Webex**	**Unstructured**	**Unstructured** **Market Sim Webex**	**Reserved for CRR team data processing and participant responses** **Environment Patching**
week 4 **Unstructured Week 2**	**Unstructured**	**Unstructured** **Market Sim Webex**	**Unstructured**	**Reserved for CRR team data processing and participant responses** **Environment Patching**
week 5	**Unstructured Cont.**	**Unstructured Cont.**	**Unstructured Cont.** **Market Sim Webex**	**Reserved for CRR team data processing and participant responses** **Environment Patching**

California ISO

November 2024

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Annual (yellow)	**December** (blue) **January** (red) **Market Sim/Cutover** (black)			**1** 2025 Auction Open
4 Dec List of outages post by 5P Post January Source/Sink List 2025 Auction Closes 5P	**5** Dec Incr. Update by 5P Market Sim – Week 1	**6** Market Sim – Week 1	**7** Dec Tier 1 Opens 1A Dec Tier 1 Closes 5P Jan Hist Load Wind Opens 1A Jan Hist Load Wind Closes 5P Market Sim – Week 1	**8** Jan Frcst Load Wind Opens 1A Market Sim – Week 1
11 Dec Post Tier 1 Results by 5P Post 2025 Auction Results by 5P Jan Frcst Load Wind Closes 5P	**12** Dec Post Set-Aside Dec Tier 2 MEQ Market Sim – Week 2	**13** Dec Tier 2 Opens 1A Dec Tier 2 Closes 5P Market Sim – Week 2	**14** Market Sim – Week 2	**15** Dec Post Tier 2 Results by 5P Market Sim – Week 2
18 Market Sim – Week 3	**19** Dec Auction Opens 1A Market Sim – Week 3	**20** Dec Auction Closes 5P Dec UDCs submit LM data by 12P Market Sim – Week 3	**21** Market Sim – Week 3	**22** Dec Auction results post by 5P Market Sim – Week 3
25 Jan Post CRR FNM by 5P Market Sim – Week 3	**26** Market Sim – Week 3	**27** Jan Post MEQ Market Sim – Week 3	**28** Holiday (Thanksgiving)	**29** Holiday (Thanksgiving)

December 2024

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
2 Post February Source/Sink List	**3** Market Sim – Week 4	**4** Market Sim – Week 4	**5** Market Sim – Week 4	**6** Jan List of outages post by 5P
9 Feb Hist Load Wind Opens 1A Feb Hist Load Wind Closes 5P	**10** Jan Incr. Update by 5P Feb Forecast Load Wind Open 1A Market Sim – Week 5	**11** Feb Forecast Load Wind Closes 5P Market Sim – Week 5	**12** Jan Tier 1 Opens 1A Jan Tier 1 Closes 5P Market Sim – Week 5	**13** Jan Post Tier 1 Results by 5P
16 Jan Post Set-Aside Jan Tier 2 MEQ	**17** Jan Tier 2 Opens 1A Jan Tier 2 Closes 5P	**18**	**19** Jan Post Tier 2 Results by 5P	**20** Jan UDCs submit LM data by 12P
23 Jan Auction Opens 1A	**24** Jan Auction Closes 5P	**25**	**26** Feb Post CRR FNM by 5P	**27** Jan Auction results post by 5P
30 Feb Post MEQ	**31**			

Legend:
- 🟥 January
- 🟦 February
- ⬛ Market Sim/Cutover

January 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
■ **February** ■ **March** ■ **Market Sim/Cutover**		**1** Holiday (New Year's Day)	**2**	**3** Feb List of outages post by 5P
6 Post March Source/Sink List	**7** Feb Incr. Update by 5P	**8** Mar Hist Load Wind Opens 1A Mar Hist Load Wind Closes 5P (Entered in current system, will be migrated to new System)	**9** Feb Tier 1 Opens 1A Feb Tier 1 Closes 5P Mar Frcst Load Wind Opens 1A	**10** Mar Frcst Load Wind Closes 5P
13 Feb Post Tier 1 Results by 5P	**14** Feb Post Set-Aside Feb Tier 2 MEQ	**15** Feb Tier 2 Opens 1A Feb Tier 2 Closes 5P	**16**	**17** Feb UDCs submit LM data by 12P Feb Post Tier 2 Results by 5P
20 Holiday (Martin Luther King's B-Day)	**21**	**22** Feb Auction Opens 1A	**23** Feb Auction Closes 5P	**24**
27 Feb Auction results post by 5P	**28** Mar Post CRR FNM by 5P – on SFTP site Production Deployment –Phase 1 cutover	**29** Production Deployment –Phase 1 cutover	**30** Production Deployment –Phase 1 cutover	**31** Production Deployment – Phase 1 cutover Complete

February 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
■ March ■ April					
3 **New System Online** **Mar Post MEQ** **Post April Source/Sink List**	**4**	**5** **Apr CEC Load Wind Opens 1A** **Apr CEC Load Wind Closes 5P**	**6** **Mar List of outages post by 5P** **Mar Incr. Update by 5P** **Apr Hist Load Wind Opens 1A** **Apr Hist Load Wind Closes 5P**	**7** **Mar Tier 1 Opens 1A** **Mar Tier 1 Closes 5P** **Apr Frcst Load Wind Opens 1A**	
10 **Apr Frcst Load Wind Closes 5P**	**11** **Mar Post Tier 1 Results by 5P**	**12** **Mar Post Set-Aside** **Mar Tier 2 MEQ**	**13** **Mar Tier 2 Opens 1A** **Mar Tier 2 Closes 5P**	**14**	
17 **Holiday** **(Presidents Day)**	**18** **Mar Post Tier 2 Results by 5P**	**19**	**20** **Mar UDCs submit LM data by 12P** **Mar Auction Opens 1A**	**21** **Mar Auction Closes 5P** **Apr Post CRR FNM by 5P**	
24	**25** **Mar Auction results post by 5P**	**26** **Apr Post MEQ**	**27**	**28**	

QUESTIONS?

Next Steps

- Next meeting is Thursday Sep 26, 2024
- Discuss following topics
- Visit CPG webpage for more information: https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group

REGISTRATION IS OPEN

2024 STAKEHOLDER SYMPOSIUM

Welcome reception - Oct. 29
at Kimpton Sawyer Hotel, Sacramento, CA

Symposium program - Oct. 30
SAFE Credit Union Convention Center
Sacramento, CA

Visit the event website: www.reg.eventmobi.com/2024stakeholdersymposium

SPONSORSHIP OPPORTUNITIES AVAILABLE

Save the Date - Resource Interconnection Standards Fair on 9/17/24

The objective of this educational forum is to provide stakeholders with an opportunity to learn more about the ISO's interconnection process and recent changes affecting Cluster 15. If you plan to attend the meeting in person, please register by end of day Sept. 13, 2024.

The forum will include a series of presentations and discussions that outline the interconnection requirements for a new resource to be able to connect to the ISO grid. Presentations will cover a range of topics from submitting an interconnection request application to declaration of commercial operation. Transmission projects will not be addressed at this fair.

The following stakeholders are encouraged to participate:
•Individuals who have submitted an interconnection request application for Cluster 15
•New and existing interconnection customers
•Regulatory agencies
•Consultants
•Trade associations
•Participating Transmission Owners
Stakeholders are invited to submit questions in advance to be addressed during the meeting. Please send questions to isostakeholderaffairs@caiso.com. Stakeholders will also have an opportunity to ask question after each topic is presented during the event.

The final agenda and presentations will be posted prior on the meetings webpage.

California ISO

ISO Public

New Policy Initiatives Timeline

The California ISO has launched the Policy Initiatives Timeline to offer stakeholders a concise overview of ongoing policy initiatives. At a glance, it offers a snapshot view of key details such as the status of each initiative, projected timelines, and the current phase of the stakeholder engagement process. Updates to this timeline will be made weekly and posted on the policy initiatives landing page. For more information, stakeholders are encouraged to reach out to ISOStakeholderAffairs@caiso.com.

REFERENCE SLIDES

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

California ISO

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			

California ISO

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_Con gestionRightsRevenueUpgrade.pdf

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

California ISO

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**

California ISO

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

California ISO

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/

California ISO

CAISO B2B Improvements – CRR Developer Forum

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

RESTful services

About status

SERVICE	SPECIFICATION	DOCUMENTATION	STATUS	RELEASE	EFFE(
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

CAISO CRR API Mock Services

https://mapstage-apimock.caiso.com/mocks?appname=crr
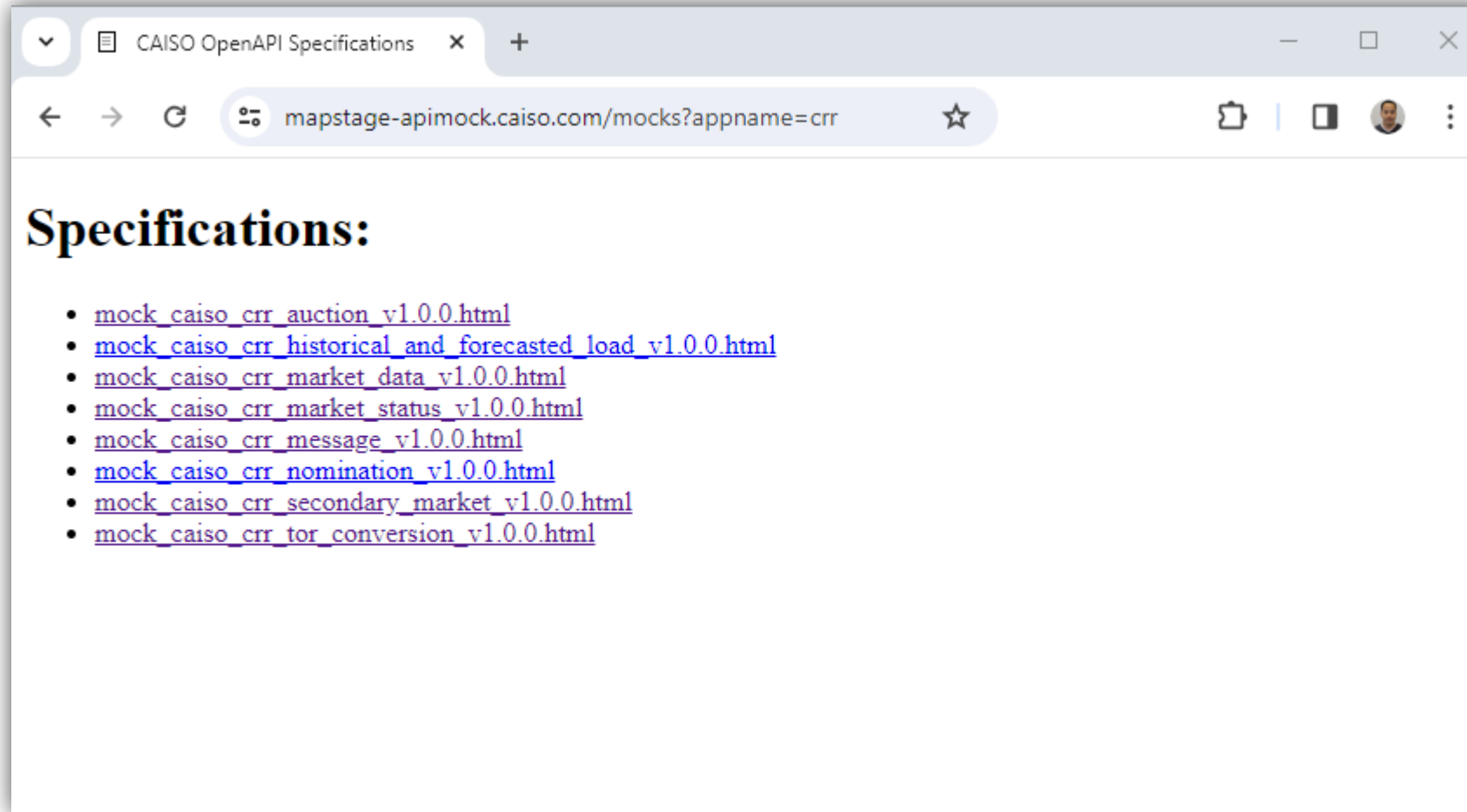
CAISO B2B Improvements – Example: CRR Auction API

California ISO

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

California ISO

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.

California ISO

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 ReleaseNotes

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

California ISO