



California ISO

Congestion Revenue Rights (CRR) Upgrade Project Customer Partnership Group

Nov 21, 2024

10:00 a.m.–11:00 a.m. (Pacific Time)

Web Conference Information	Conference Call Information
<p>Web Address: https://caiso.webex.com/caiso/j.php?MTID=m4c62047c8ca3c36c50e2d1182518f8f9</p> <p>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.</p>	<p>1-844-621-3956 United States Toll Free +1-650-479-3208 United States Toll</p> <p>Access code: 248 7236 5119 password: CRRCPG</p>
<p>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.</p>	
<p>https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group</p>	

Housekeeping reminders

This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.

The meeting is structured to stimulate 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.

Instructions for raising your hand to ask a question

Open the Participant and Chat panels from the bottom right.

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: *3 only works 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 Brenda Marquez or to all panelists.

Agenda

Time (PST)	Topic
10:00 – 10:05	Welcome
10:05 – 10:25	B2B Spec Updates
10:25 – 10:30	CRR Upgrade Project timeline Update
10:30 – 10:35	Map Stage Provisioning Update
10:35 – 10:45	Market Sim and Cutover plans
10:45 – 10:55	Questions and Next steps

CRR – B2B Spec Updates - All

- Updated responses to have HTTP status codes 403, 404, and 500 with content of object CRRServiceException;
- Updated CRRServiceException by having an array of 'ErrorDetail' which contain severity, errorCode, and errorDescription;
- Added comments to description of CRRServiceException;
- Error code SER0028 is used for response 404 and error code SER0029 for response 500;
- Updated all date-time field examples and remove 'milliseconds' component.; example: '2021-09-01T07:00:00Z'
- Added error code SER0030;

CRR – B2B Spec Updates - Historical Forecasted Load

- Fixed a typo error - changed 'submissionWindowStatus' to 'submissionWindow';
- Removed maxLength from effectiveDate datetime;
- Added loadSubmissionStatus to 'LoadDataResponseSet';
- Updated description to elaborate when error status occurs in 'SubmissionStatus' and 'Status';
- Removed PREP from enum of 'LoadSubmissionWindowStatus';
- Renamed endpoint from activeHistLoadSubmissionWindow -> 'openHistLoadSubmissionWindow' and activeForecastLoadSubmissionWindow -> 'openForecastLoadSubmissionWindow';
- Removed error code LHFV0032 because it is a duplicate of SER0002;

CRR – B2B Spec Updates - Auction

- Changed required property from bidId to crrId in 'NewOffer';
- Added requiredCredit to required field and added errorMessage as optional field in PortfolioCredit;
- Added description to INVALID portfolio status;
- Replaced error code SER0018 with GEN0003;
- Replaced error code ATH0002 with SEC0001;
- Removed error code MKT0002;
- Replaced error code NOM0128 with AUC0037 for status validation of portfolio during submission;
- Added the error code POR0010 that was accidentally removed.
- Changed prefix of error codes in description of 'CRRServiceException' to 'POR' for Portfolio Validations that are applicable to both Nomination and Auction APIs;

CRR – B2B Spec Updates - Secondary Market

- Updated 'TargetRespondingMp' model 'Price' field to be required;
- Added 'SMT0082' error code.;
- Removed error codes that are not applicable to CRR secondary market from 'CRRServiceException';
- Replace error code SER0018 with GEN0003;
- Replace error code ATH0002 with SEC0001;
- Update error descriptions for error codes SER0001 and SMT0146;

CRR – B2B Spec Updates - TOR Conversion

- Removed all 'maxLength' specification from Enum and date-time schemas;
- Fixed 'dateTime' -> 'date-time'.;
- Removed error codes that are not used;
- Updated error descriptions for error codes SER0001 and SMT0146;

CRR – B2B Spec Updates - Market Data

- Replaced error code ATH0002 with SEC0001;
- Removed error codes that are not applicable to CRR market data APIs;
- Updated JSON schema version numbers in the descriptions of download types;

CRR – B2B Spec Updates - Market Status

- Replaced error code ATH0002 with SEC0001;
- Removed error codes that are not applicable to market status APIs;
- Updated descriptions of 'activeAllocationMarkets' and 'activeAuctionMarkets' because the active markets include markets in PREP, OPEN, and CLOSED.

CRR – B2B Spec Updates - Message

- Replaced error code ATH0002 with SEC0001;
- Removed error codes that are not applicable to CRR message APIs;

CRR – B2B Spec Updates - Load Migration

- Removed errorMessage from UDCSubmissionStatus;
- Removed ERROR from enum of SubmissionStatus;

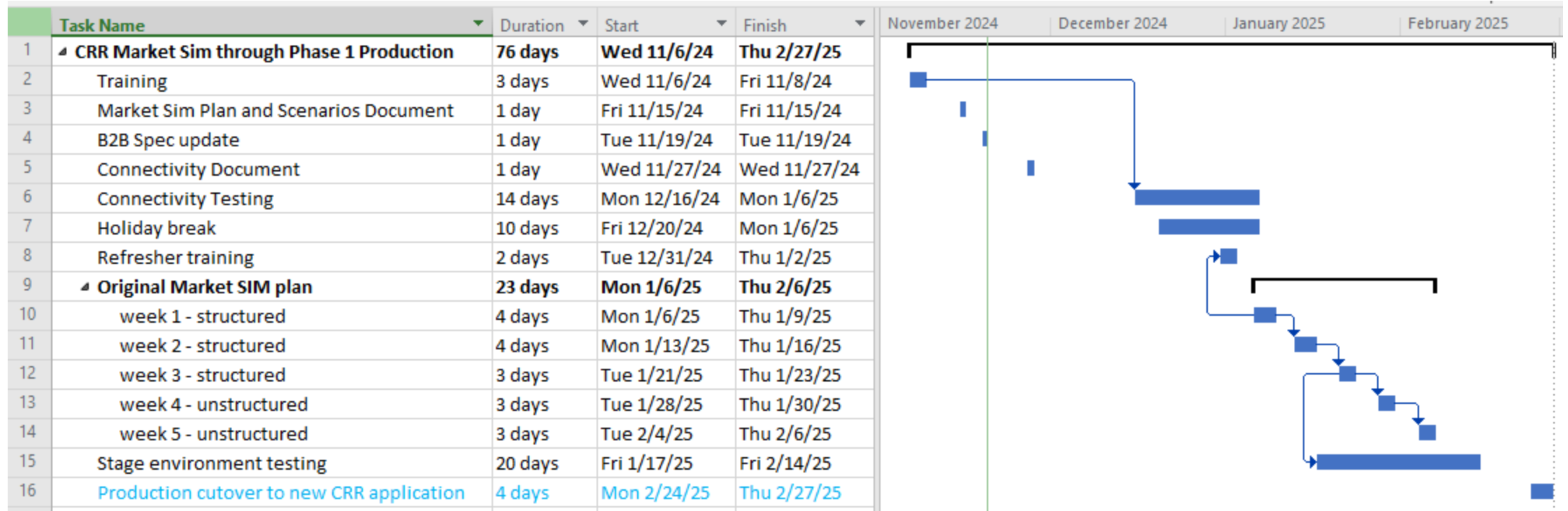
CRR – JSON Schema Update

Schema Name	Change Logs
CRRExistingCRRs_v1.1.2.draft-07.schema.json CRRPrivateAuction_v1.0.1.draft-07.schema.json CRRPublicAuctionResult_v1.1.1.draft-07.schema.json CRRTorConversionRequest_v1.0.1.draft-07.schema.json CRRLoadMigrationResult_v1.0.1.draft-07.schema.json	Added examples for StartDate and EndDate
CRRHistoricalForecastLoad_v1.0.1.draft-07.schema.json	Added examples for EffectiveDate
CRRSourceandSinkNameMapping_v1.0.1.draft-07.schema.json	Add examples for EffectiveStartDate
CRRPrivateAllocation_v1.1.3.draft-07.schema.json	Added TER to CRRType enum;
CRRPublicAllocationResult_v1.0.3.draft-07.schema.json	Added examples for StartDate and EndDate
CRRResource_v1.0.2.draft-07.schema.json	Remove PMax from Required properties
CRRSecondaryMarketOffer_v1.0.1.draft-07.schema.json	<ul style="list-style-type: none"> Enum of SmOfferStatus is changed from PENDING_MP_RESPONSE to PENDING_RESPONSE; Renamed example element to examples
CRRSecondaryMarketResponse_v1.0.2.draft-07.schema.json	<ul style="list-style-type: none"> Enum of SmResponseStatus is changed from PENDING_MP_RESPONSE to PENDING_RESPONSE; Update description of CrrID; Renamed example element to examples
CRRMEQResult_v1.2.0.draft-07.schema.json	<ul style="list-style-type: none"> Made some elements in meqDefType optional Removed 'LoadMetric', 'TransmissionOwnershipRights', 'ExistingTransmissionContractRights', 'AdjustedLoadMetric', 'SeasonalCRRs', 'LongTermCRRs', 'LoadMigrationCRRs' from Required fields; maxLenth -> maxLength
CRRSEQResult_v1.2.0.draft-07.schema.json	<ul style="list-style-type: none"> Made some elements in seqDefType optional Removed 'LoadMetric', 'LoadMigrationAdjust', 'TransmissionOwnershipRights', 'ExistingTransmissionContractRights', 'AdjustedLoadMetric', 'LongTermCRRs', 'LoadMigrationCRRs' from Required fields;
CRRUpperBoundResult_v1.2.0.draft-07.schema.json	<ul style="list-style-type: none"> Made some elements in upperBoundDefType optional Removed 'PreviousYearCRRs', 'ExpiringLongTermPNP', 'LongTermCRRs', 'LoadMigrationCRRs' from Required fields;

CRR System Upgrade – Project Update & Timeline

Updated November 2024

- UI testing has completed in preparation for Market SIM while API and Security testing continues
- Market SIM Plan/Scenarios and B2B spec update provided



- April is first month with processes fully on the new system
 - April FNM posting will post 1 week later

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**

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)

Market Sim plan

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

Published on <https://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx>:

[Market Simulation Plan - Congestion Revenue Rights System Upgrade](#) 11/15/2024

[Business Requirements Specifications v1.7 - Congestion Revenue Rights System Upgrade](#) 10/28/2024

Market Sim 2024



	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
	<p>week 1 T-2w - Connectivity Prior to Market Sim - Kickoff and Overview</p> <ul style="list-style-type: none"> ● Market Sim Plan ● High level overview of new system ● Uploading and Downloading <ul style="list-style-type: none"> ○ Manual Entry, ○ File ○ Upload, API ● Public/Private Downloads ● Messages ● Sorting and Filtering ● Documentation and Resources ● Contact Information <p>Market Sim WebEx 1-2PM PST</p>	<p>Miscellaneous process</p> <ol style="list-style-type: none"> 1.UDC Load Migration Submissions and post (N-hour) 2. LT Re-nomination 3. Secondary Market 4. TOR conversion submission <p>Allocation Monthly Participants</p> <ol style="list-style-type: none"> 1. CEC Load Forecast Submissions 2. Submit Historical Load 3. Submit Forecast Load <p>Allocation Annual Participants</p> <p>Submit AN Historical Load for 2024</p> <p>Public/Private messages Public/Private downloads (existing CRRs)</p> <p>Market Sim WebEx 1-2PM PST</p>	<p>Miscellaneous process</p> <ol style="list-style-type: none"> 1. UDC Load Migration Submissions Open 2. Secondary Market 3. TOR conversion approval <p>Allocation Monthly Participants</p> <p>Post Monthly nomination cap (MEQ T1)</p> <p>Allocation Annual Participants</p> <p>Post Annual nomination cap (SEQ T1, SEQ LT, UB, SS T1, SS LT)</p> <p>Public/Private messages</p> <p>Market Sim WebEx 1-2PM PST</p>	<p>Miscellaneous process</p> <ol style="list-style-type: none"> 1. UDC Load Migration Submissions close and post 2. Secondary Market <p>Market Sim WebEx 1-2PM PST</p>	<p>Reserved for CRR team data processing and participant responses</p> <p>Environment Patching</p>	

<p>week 2</p> <p>Reserved for CRR team data processing and participant responses</p> <p>CRR team setup for Monthly Markets</p> <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Monthly Participants</u></p> <ol style="list-style-type: none"> 1. Submit Nominations for Tier 1 Monthly Market 2. Windows Close on <u>Wednesday</u> 3. Download Nomination Cap data 4. Download Allocation Market MN V0 ETC and T1 model results(NDA user) <p><u>Auction Monthly Participants</u></p> <ol style="list-style-type: none"> 1. Submit Auction Portfolios Monthly Auction Market <ul style="list-style-type: none"> ● Buy Bids, Sell Offers ● Credit - provide \$10mil to all MPs for testing 2. Windows Close on <u>Thursday</u> 3. Download Auction market model results(NDA user) <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Monthly Participants</u></p> <ol style="list-style-type: none"> 1. Download Allocation Market T1 Results 2. Submit Nominations for Tier 2 Monthly Market 3. Windows Close on <u>Thursday</u> 4. Download Nomination Cap T2 data 5. Download Allocation Market T2 model results(NDA user) <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Monthly Participants</u></p> <p>Review results</p> <p><u>Auction Monthly Participants</u></p> <p>Review results</p> <p>Market Sim WebEx 1-2PM PST</p>	<p>Reserved for CRR team data processing and participant responses</p> <p>Environment Patching</p>
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<p>week 3</p> <p>Reserved for CRR team data processing and participant responses</p> <p>CRR team setup for Annual markets</p> <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Annual Participants</u></p> <ol style="list-style-type: none"> 1. Submit Nominations for Tier 1 Annual Market 2. Windows Close on <u>Wednesday</u> 3. Download Nomination Cap data 4. Download Allocation Market AN V0 V1 and T1 model results(NDA user) <p>1. Submit Nominations for LT Annual Market</p> <ol style="list-style-type: none"> 2. Windows Close on <u>Wednesday</u> 3. Download Nomination Cap data 4. Download Allocation Market ETC and LT model results(NDA user) <p><u>Auction Annual Participants</u></p> <ol style="list-style-type: none"> 1. Submit Auction Portfolios Annual Auction Market <ul style="list-style-type: none"> ● Buy Bids, Sell Offers ● Credit - provide \$10mil to all MPs for testing 2. Re-submit for any processes or scenarios which had issues previously 3. Windows Close on <u>Thursday</u> 4. Download Auction market model results(NDA user) <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Annual Participants</u></p> <ol style="list-style-type: none"> 1. Submit Nominations for Tier 2 Annual Market 2. Windows Close on <u>Thursday</u> 3. Download Nomination Cap T2 data 4. Download Allocation Market T1 Results <p>Market Sim WebEx 1-2PM PST</p>	<p><u>Allocation Annual Participants</u></p> <p>Review results</p> <p><u>Auction Annual Participants</u></p> <p>Review results</p> <p><u>Miscellaneous Annual process</u></p> <ol style="list-style-type: none"> 1. Submit Auction Portfolios for Participant requested scenarios <p>Market Sim WebEx 1-2PM PST</p>	<p>Reserved for Q&A sessions, issue reporting, etc.</p> <p>Environment Patching</p>
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week 4	Unstructured <ul style="list-style-type: none"> • Re-submit for any process of scenarios for customer specific testing Market Sim WebEx 1-2PM PST	Unstructured	Unstructured	Reserved for CRR team data processing and participant responses Environment Patching
week 5	Unstructured Cont. Market Sim WebEx 1-2PM PST	Unstructured Cont.	Unstructured Cont.	Reserved for CRR team data processing and participant responses Environment Patching

February 2025

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
27 week 4 Resolve any defects found during market Sim	28 Unstructured	29 Unstructured	30 Unstructured	31 Unstructured	
3 week 5 Unstructured	4 Unstructured	5 Unstructured	6 Unstructured	7 Unstructured	
10 week 6	11	12	13	14	
17 week 7 Buffer week	18 Buffer week	19 Buffer week	20 Buffer week	21 Buffer week	
24 week 8 Deploy to Production Initiate Data Migration plan from RI	25 Initiate Data Migration plan	26 Initiate Data Migration plan	27 Initiate Data Migration plan	28  Market Sim /UAT  Production	

QUESTIONS?

Next Steps

- Next meeting is tentatively scheduled for Thursday Dec 19, 2024
- Visit CPG webpage for more information: <https://www.caiso.com/meetings-events/topics/congestion-revenue-rights-crr-settlement-upgrade-project-customer-partnership-group>

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

CRR Service Endpoint Details

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

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.

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 NDAfiles
 - 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**

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 marketperiod

- **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

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/>

CAISO B2B Improvements – CRR Developer Forum

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

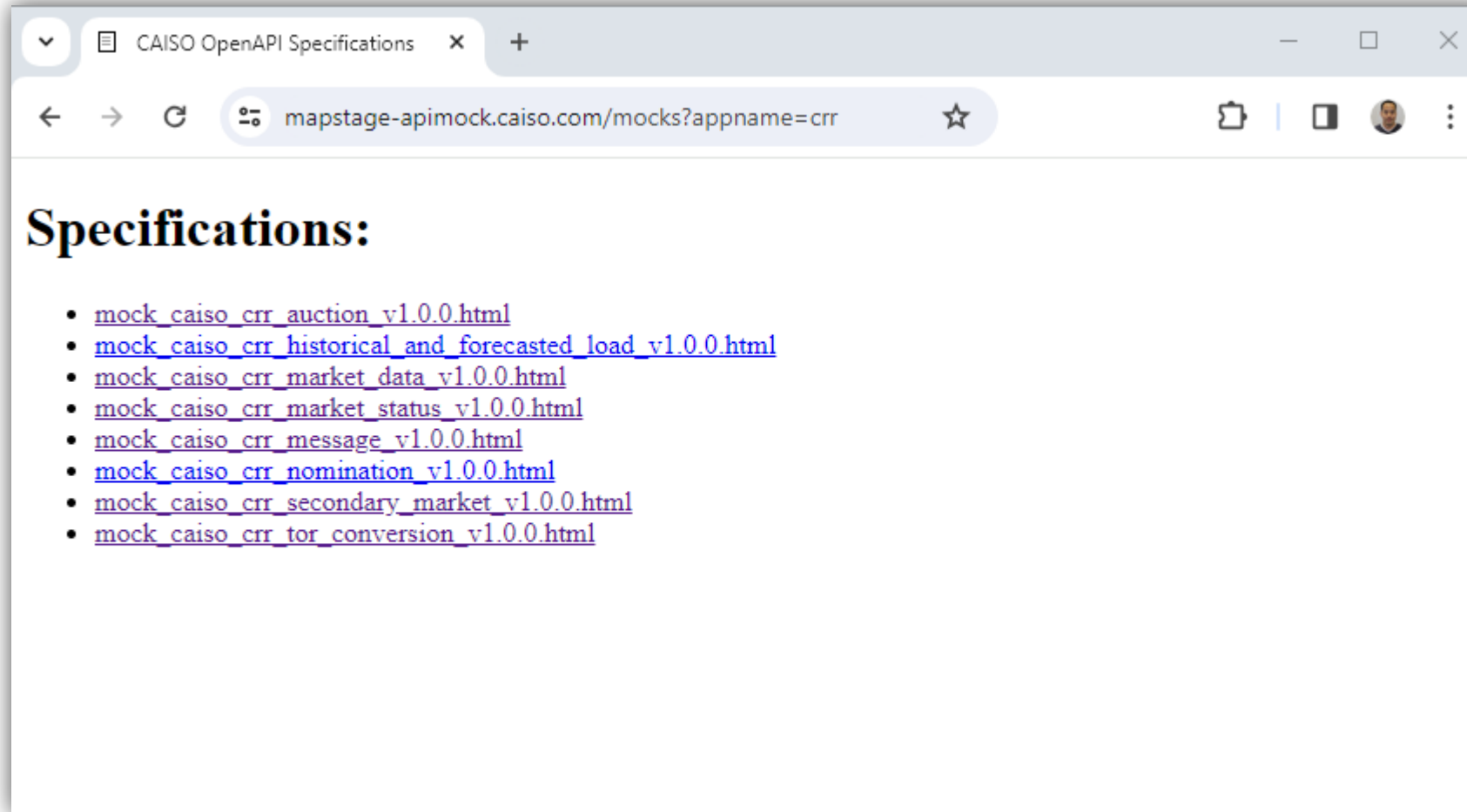
RESTful services

 About status

<div>Search RESTful services</div> <div>Filter</div>					
SERVICE	SPECIFICATION	DOCUMENTATION	STATUS	RELEASE	EFFECTIVE DATE
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

```
+ 1 openapi: 3.0.0
+ 2 servers:
+ 3   - url: https://virtserver.swaggerhub.com/RI-GM/caiso_crr_auction_v1.0.0_openapi/1.0.0
+ 4
+ 5 info:
+ 6   description: This includes all openapi services for CRR bids and offers
+ 7   version: "1.0.0"
+ 8   title: CRR Auction API
+ 9   contact:
+ 10    email: ihedge-support@resource-innovations.com
+ 11
+ 12 tags:
+ 13   - name: write
+ 14     description: require read/write access
+ 15   - name: read
+ 16     description: requires read only
+ 17
+ 18 paths:
+ 19   /auction/v1.0/portfolio:
+ 20     get:
+ 21       tags:
+ 22         - read
+ 23       summary: gets bids and offers for given market name
+ 24       operationId: getPortfolio
+ 25       description: |
+ 26         By passing in the appropriate market name, portfolio name, and participant name, the auction portfolio will be returned.
+ 27       parameters:
+ 28         - $ref: '#/components/parameters/MarketName'
+ 29         - $ref: '#/components/parameters/PortfolioName'
+ 30         - $ref: '#/components/parameters/ParticipantName'
+ 31
+ 32       responses:
+ 33         '200':
+ 34           description: search results matching criteria
+ 35           content:
+ 36             application/json:
+ 37               schema:
+ 38                 $ref: '#/components/schemas/Portfolio'
```

API SUMMARY

API METHODS - READ

getPortfolio
getPortfolioList
getPortfolioRequiredCredit
getPortfolioStatus

API METHODS - STATUS

getStatus

API METHODS - WRITE

deletePortfolio
portfolioCreation
portfolioSubmission
postPortfolioRetraction

CRR Auction API

API and SDK Documentation

Version: 1.0.0

This includes all openapi services for CRR bids and offers

Read

getPortfolio

gets bids and offers for given market name, portfolio name, and logged-in user

By passing in the appropriate market name, portfolio name, and participant name, the auction portfolio will be returned.

GET

/auction/v1.0/portfolio

Usage and SDK Samples

Curl Java Android Obj-C JavaScript C# PHP Perl Python

```
curl -X GET \
-H "Accept: application/json" \
"https://virtserver.swaggerhub.com/RI-GM/caiso_crr_auction_v1.0.0_openapi/1.0.0/auction/v1.0/portfolio?marketName=&portfolioName=&participantName="
```

CAISO B2B Improvements – Free Swagger Editor Tool

<https://editor.swagger.io/>

The screenshot displays the Swagger Editor web application. The left pane shows the OpenAPI definition in YAML format, and the right pane shows the rendered API documentation.

Swagger Editor Interface:

- Left Pane (YAML Definition):**

```
1 openapi: 3.0.0
2 servers:
3   - url: https://virtserver.swaggerhub.com/RI-GM/
      /caiso_crr_auction_v1.0.0_openapi/1.0.0
4
5 info:
6   description: This includes all openapi services for CRR bids and
      offers
7   version: "1.0.0"
8   title: CRR Auction API
9   contact:
10    email: ihedge-support@resource-innovations.com
11
12 tags:
13   - name: write
14     description: require read/write access
15   - name: read
16     description: requires read only
17
18 paths:
19   /auction/v1.0/portfolio:
20     get:
21       tags:
22         - read
23       summary: gets bids and offers for given market name, portfolio
24         name, and logged-in user
25       operationId: getPortfolio
26       description: |
27         By passing in the appropriate market name, portfolio name,
28         and participant name, the auction portfolio will be
29         returned.
30       parameters:
31         - $ref: '#/components/parameters/MarketName'
32         - $ref: '#/components/parameters/PortfolioName'
33         - $ref: '#/components/parameters/ParticipantName'
```
- Right Pane (Rendered API):**
 - Title:** CRR Auction API 1.0.0 OAS3
 - Description:** This includes all openapi services for CRR bids and offers
 - Contact:** [Contact the developer](#)
 - Servers:** https://virtserver.swaggerhub.com/RI-GM/caiso_crr_auction_v1.0.0_openapi/
 - Tags:** write (require read/write access)
 - Operations:**
 - POST** /auction/v1.0/portfolioCreation: creates a new auction portfolio
 - POST** /auction/v1.0/portfolioSubmission: submits portfolio to the specified auction
 - POST** /auction/v1.0/portfolioRetraction: retracts portfolio from being submitted to the specified auction

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.

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 marketparticipants
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
v2.0.0	Added a Major version for a service
v2.0.1	Edits were made to documentations, no functional changes
v3.0.0	Added a new service