



Working Draft 1.0

API Developer Guide
Quote Management

October 2018

**This draft represents MEF work in progress and is
subject to change.**

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52

Table of Contents

53	1.	List of Contributing Members	1
54	2.	Abstract	1
55	3.	Scope	1
56	4.	Resource Models	2
57	4.1	Quote Resource Model	2
58	5.	State Diagrams	3
59	5.1	Quote State Machine	3
60	5.2	Quote Item State Machine	4
61	6.	Notifications	5
62	6.1	Subscribe to Notifications	5
63	6.2	Receive Notification	6
64	7.	JSON Representation Samples	7
65	7.1	Quote	7
66	8.	API Interactions	11
67	8.1	Sequence Diagram	11
68	8.2	Operations	12
69	8.2.1	Create Quote	12
70	8.2.2	Retrieve Quotes	14
71	8.2.3	Retrieve a Single Quote by Quote Identifier	16
72	8.2.4	Cancel or Reject Quote	17

73

74

75

List of Figures

76	Figure 1 - Quote Resource Model.....	2
77	Figure 2 - Quote State Machine	3
78	Figure 3 - Quote Item State Machine.....	4
79	Figure 4 - Quote Management API Interactions	11

80

List of Tables

81	Table 1 – Contributing Member Companies	1
82	Table 2 – Quote State Values.....	4
83	Table 3 – Quote Item State Values	5

84

1. List of Contributing Members

The following members of MEF participated in the development of this document and have requested to be included in this list.

Member Company

Table 1 – Contributing Member Companies

2. Abstract

This API Guide is intended to help software developers to implement the MEF Quote Management API. The API swagger is available on the MEF [GitHub](#). This document covers the following topics:

- Quote API Resource Model
- Quote Resource Lifecycle
- Quote API Notifications
- Quote Resource JSON Representation
- Description of all API Operations

3. Scope

The scope of this API guide covers the following quote functions:

- Creating a Quote
- Cancelling or rejecting a Quote
- Retrieving Quote instances based upon a filter of Quote attributes
- Retrieving a specific Quote instance based upon a Quote identifier
- Support for Quote Notifications

4. Resource Models

4.1 Quote Resource Model

The Quote REST resource model is as follows:

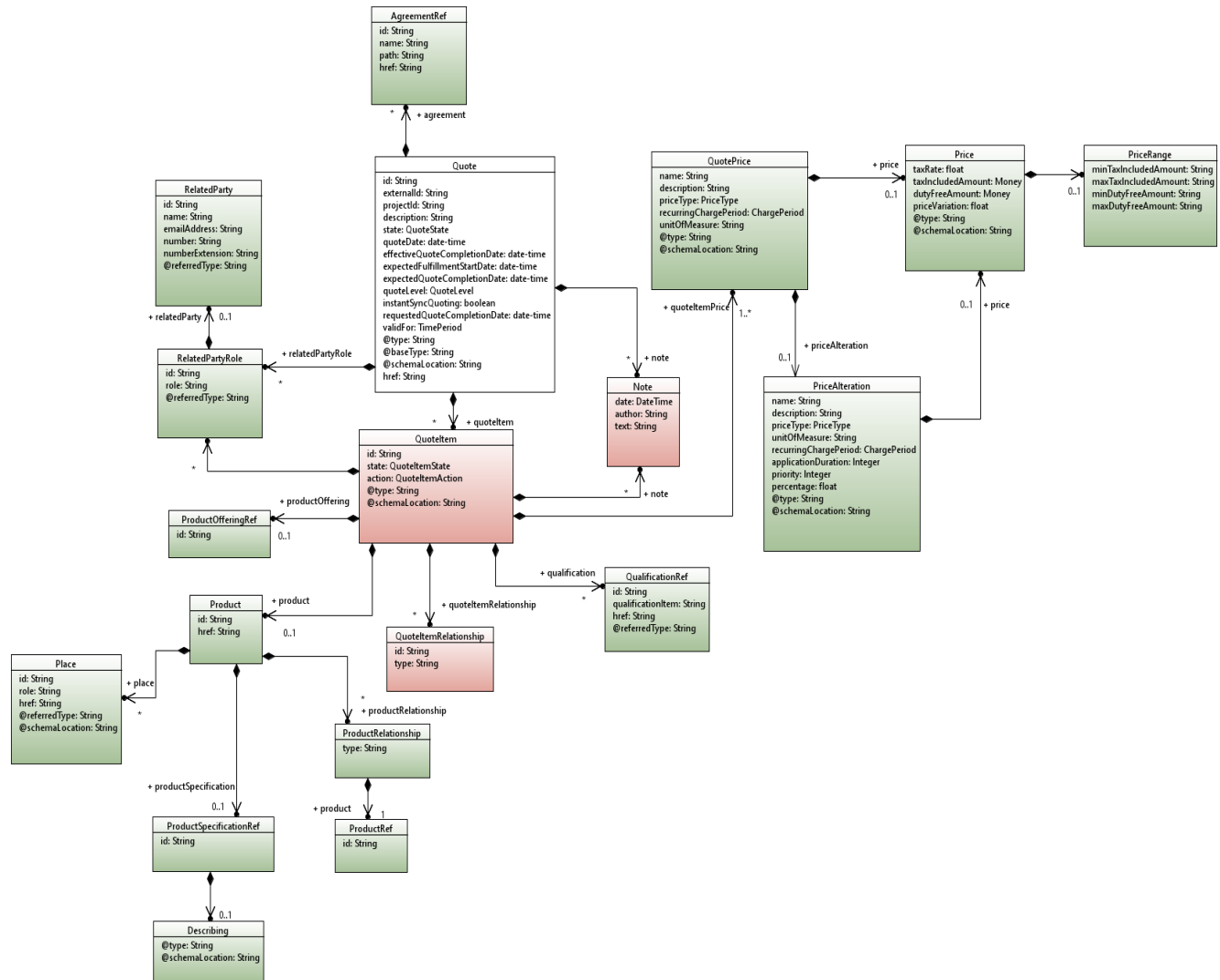


Figure 1 - Quote Resource Model

Color coding scheme:

- White box: API main resource
- Pink boxes: API sub resource(s)
- Green boxes: API related/referred resource(s)

5. State Diagrams

5.1 Quote State Machine

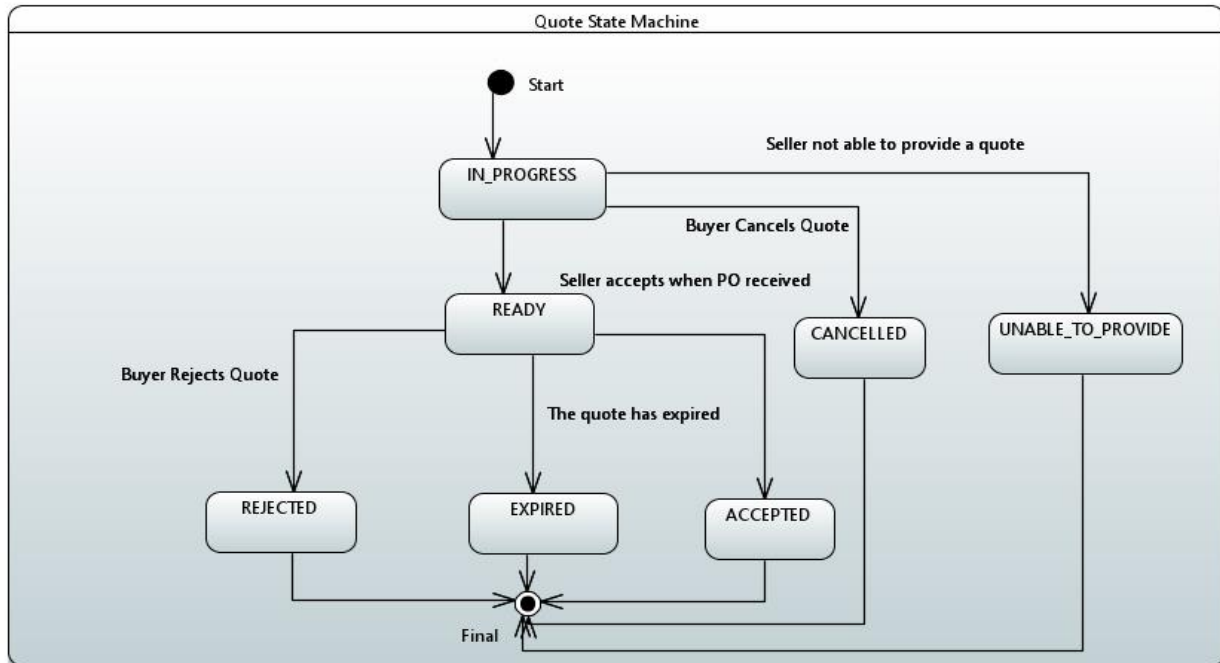


Figure 2 - Quote State Machine

The definitions of the various quote states are as follows:

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the quote is currently in the hands of the Seller to build it according to the Buyer's requirements. The pricing and expected completion date should be updatable in this state. At least one quote item is in an IN_PROGRESS state. No quote items may be in an UNABLE_TO_PROVIDE state.
READY	The READY state is where the quote has been internally approved by the Seller and sent to the Buyer. The quote is no longer updatable. All quote items must be in a READY state. Note: future release of this specification may make quotes updateable in certain circumstances.
CANCELLED	A quote can only be cancelled when it is in an IN_PROGRESS state. The CANCELLED state is when the quote process is stopped from a Buyer through an explicit cancellation request. Quote items may be in an IN_PROGRESS or READY state. Any quote items in an IN_PROGRESS state are moved to an ABANDONED state.

UNABLE_TO_PROVIDE	This state is set by the Seller when he is unable to provide a quote. One quote item is an UNABLE_TO_PROVIDE state. Any quote items in an IN_PROGRESS state are moved to an ABANDONED state. When a quote is in the UNABLE_TO_PROVIDE state, quote items might be in the READY state.
REJECTED	The REJECTED state is used when the Buyer does not wish to progress with the quotation. The buyer changes the state of the quote to REJECTED. In order for a buyer to actually reject the quote, all quote items must be in a READY state.
EXPIRED	This state is set by the Seller from a READY state to indicate that the quote will no longer be honored as it has expired. All the quote items must be in a READY state
ACCEPTED	The ACCEPTED state is set by the Seller. It is triggered by a product order. All quote items must be in a READY state. Note: In a future release the Buyer may be able to set the state to ACCEPTED. .

Table 2 – Quote State Values

5.2 Quote Item State Machine

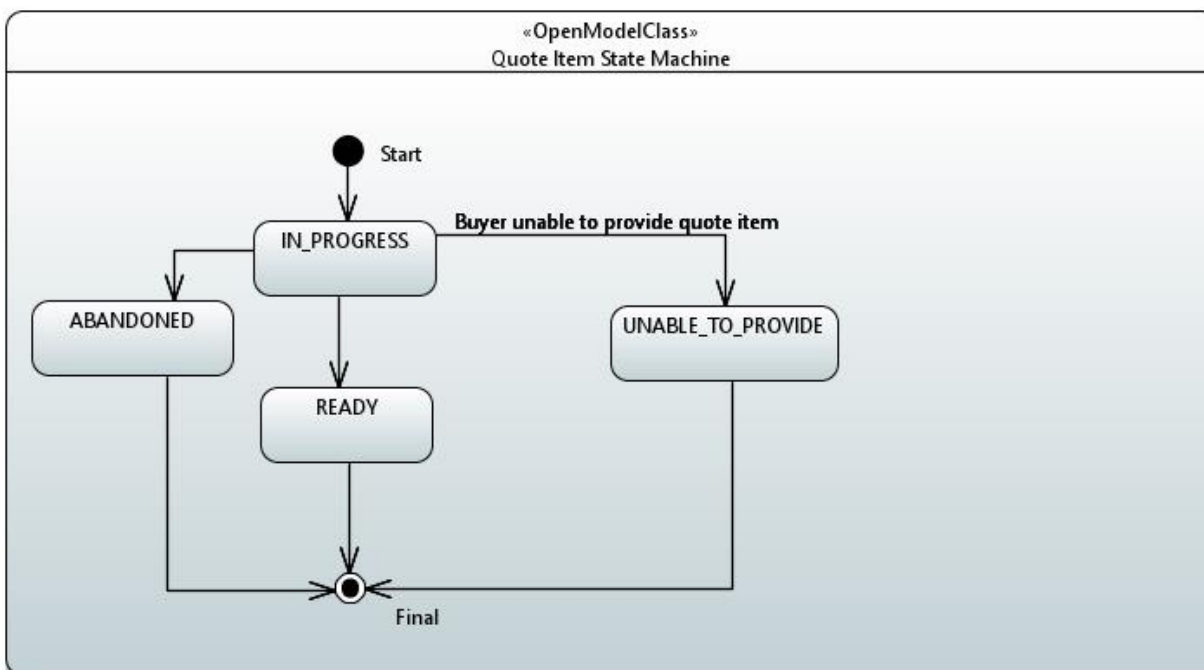


Figure 3 - Quote Item State Machine

The definitions of the various quote item states are as follows:

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the quote item is currently in the hands of the SP sales team to build it regarding customer requirements. The quote item is under construction and should need more information.
UNABLE_TO_PROVIDE	The UNABLE_TO_PROVIDE state is set on a quote item when the seller cannot provide a quote for this item.
READY	The READY state is where the quote item has been internally approved by the Seller.
ABANDONED	The ABANDONED state is applied to quote items that are in an IN_PROGRESS state when the quote is moved to a terminal state other than READY.

Table 3 – Quote Item State Values

6. Notifications

The following notifications are supported in this API:

- quoteObjectCreationNotification
- quoteAttributeValueChangeNotification
- quoteStateChangeNotification

In order to receive a Notification, a Buyer needs

- to subscribe to a notification
- to provide an Event API in order to allow the Seller to POST notifications to him.

6.1 Subscribe to Notifications

By doing the following request the Buyer will subscribe to quote state change notifications for his Quotes:

```
POST serverRoot/api/mef/quoteManagement/v1/hub
Accept: application/json
{
  "callback": "http://in.listener.com",
  "query": "eventType = quoteStateChangeNotification"
}
```

In yellow, this is the address where the Buyer wants to receive the quote state change notifications.

The response will be:

```
201
{
  "id": "42",
  "callback": "http://in.listener.com",
  "query": "eventType = quoteStateChangeNotification"
}
```

Note: 42 is the id of a hub resource not a quote id.

The Seller provides GET and DELETE operations on a hub resource in order to allow the Buyer to retrieve his hubs and delete any of them if necessary:

```
GET serverRoot/api/mef/quoteManagement/v1/hub
Accept: application/json
```

The API will provide a list of your hubs as in the following example:

```
[
  {
    "id": "42",
    "query": "eventType=quoteStateChangeNotification",
    "callback": "http://in.listener.com"
  },
  {
    "id": "56",
    "query": "eventType=quoteObjectCreationNotification",
    "callback": "http://in.listener.com"
  },
  {
    "id": "98",
    "query": "eventType=quoteAttributeValueChangeNotification",
    "callback": "http://in.listener.com"
  }
]
```

If the Buyer does not want any more notifications for Quote attribute value change:

```
DELETE serverRoot/api/mef/quoteManagement/v1/hub /98
Accept: application/json
```

6.2 Receive Notification

Now that the Buyer has subscribed to notifications for quote state change for example, let's suppose that a quote was posted and processed by the Seller. Now let's suppose the quote state changes. The Seller will POST an Event to the Buyer:

```
POST {callback url}
{
  "eventType": "quoteStateChangeNotification",
  "eventTime": "2018-09-27T05:46:25.0Z",
  "eventId": "92336",
  "event": {
    "quote": {
      "id": "456789"
    }
  }
}
```

The Buyer will respond with a standard answer with HTTP 201 and event id.

```
201 {
210   "id": "123"
211 }
212
213
214
```

7. JSON Representation Samples

All the JSON examples in this API Guide are provided with a grey background.

This example illustrates a quote representation (not the POST Request) for an E-Line product. Note in the example:

- Orange organization is the Buyer
- Colt is the Seller
- The following partyRoles are provided:
 - Buyer
 - Notification Contact
- The Buyer does not wish to have instant sync quoting which implies that he will wait to get a notification that the quote is ready rather than receive it in the response.
- The Buyer is expecting a FIRM quote, which implies that it is a committed quote.
- The first note is provided by the Seller, indicating processing is complete.
- The quote item represents the E-Line. It relies on two products
 - ID = 334 - The UNI
 - ID = 38 - The ENNI

7.1 Quote

The following is a JSON representation of an example of a 'Quote' resource object.

```
{
  "id": "456789",
  "href": "serverRoot/api/mef/quoteManagement/v1/quote/456789",
  "externalId": "ORGE456",
  "projectId": "ORGE",
  "description": "Quote for an Access E-Line product",
  "state": "READY",
  "quoteDate": "2018-10-09T14:15:08.843Z",
  "instantSyncQuoting": false,
  "quoteLevel": "FIRM",
  "requestedQuoteCompletionDate": "2018-10-12T14:15:08.843Z",
  "expectedQuoteCompletionDate": "2018-10-12T14:15:08.843Z",
  "expectedFulfillmentStartDate": "2018-10-12T14:15:08.843Z",
  "effectiveQuoteCompletionDate": "2018-10-12T10:03:08.843Z",
  "validFor": {
    "startDate": "2018-10-09T14:15:08.843Z",
    "endDate": "2018-10-26T14:15:08.843Z"
  },
  "note": [
    {
      "date": "2018-10-12T09:15:08.843Z",
      "author": "D.B. Brown",

```

```

255     "text": "Quote processing completed"
256   }
257 ],
258   "agreement": [
259     {
260       "id": "22",
261       "name": "MSA",
262       "path": "https://mydoc/agreement/sp3/agreementV2"
263     }
264   ],
265   "relatedPartyRole": [
266     {
267       "id": "48",
268       "role": "Buyer",
269       "relatedParty": {
270         "id": "50",
271         "@referredType": "Organization",
272         "name": "Orange",
273         "number": "+330647389207"
274       }
275     }
276   ],
277   "quoteItem": [
278     {
279       "id": "52",
280       "state": "READY",
281       "action": "INSTALL",
282       "productOffering": {
283         "id": "COLT Access E-Line"
284       },
285       "product": {
286         "productSpecification": {
287           "id": "209",
288           "describing": {
289             "@type": "E-Line Spec",
290             "@schemaLocation": "{MEF Product Spec Storage
291 Location}/ElineSpec_v2.json"
292           }
293         },
294         "productRelationship": [
295           {
296             "type": "RELIES_ON",
297             "product": {
298               "id": "334"
299             }
300           },
301           {
302             "type": "RELIES_ON",
303             "product": {
304               "id": "48"
305             }
306           }
307         ],
308         "place": [
309           {
310             "id": "392",
311             "role": "UNISite",

```

```

312         "@referredType": "FormattedAddress",
313         "@schemaLocation": "{MEF Address
314 Location}/FormattedAddress.json "
315     }
316 ]
317 },
318 "quoteItemPrice": [
319     {
320         "priceType": "RECURRING",
321         "recurringChargePeriod": "MONTH",
322         "name": "E-Line Price",
323         "description": "Price for Access E-Line 1GB",
324         "price": {
325             "taxRate": 8,
326             "taxIncludedAmount": {
327                 "value": 64.8,
328                 "unit": "GBP"
329             },
330             "dutyFreeAmount": {
331                 "value": 60,
332                 "unit": "GBP"
333             },
334             "priceVariation": 0
335         },
336         "priceAlteration": [
337             {
338                 "name": "Commitment discount",
339                 "description": "12-month commitment",
340                 "priceType": "RECURRING",
341                 "unitOfMeasure": "",
342                 "recurringChargePeriod": "MONTH",
343                 "applicationDuration": 6,
344                 "priority": 1,
345                 "percentage": 0,
346                 "price": {
347                     "taxRate": 0,
348                     "taxIncludedAmount": {
349                         "value": 10,
350                         "unit": "GBP"
351                     }
352                 }
353             }
354         ]
355     }
356 ],
357 "note": [
358     {
359         "date": "2018-10-12T09:45:08.844Z",
360         "author": "F. Sabir",
361         "text": "Quote is ready for approval"
362     }
363 ],
364 "qualification": [
365     {
366         "id": "78",

```

```
367         "href":
368         "serverRoot/api/mef/productOfferingQualificationManagement/v1/productOfferingQ
369         ualification/78",
370         "qualificationItem": "1",
371         "@referredType":
372         "ProductOfferingQualification"
373     },
374 ],
375     "relatedPartyRole": [
376     {
377         "id": "30",
378         "role": "Notification Contact",
379         "relatedParty": {
380             "id": "62",
381             "@referredType": "Individual",
382             "name": "Claude Monet",
383             "emailAddress": "claudemonet@orange.fr",
384             "number": "+330629382913",
385             "numberExtension": ""
386         }
387     }
388 ]
389 }
390 ]
391 }
392
393
```

8. API Interactions

8.1 Sequence Diagram

The quote interaction model is described below:

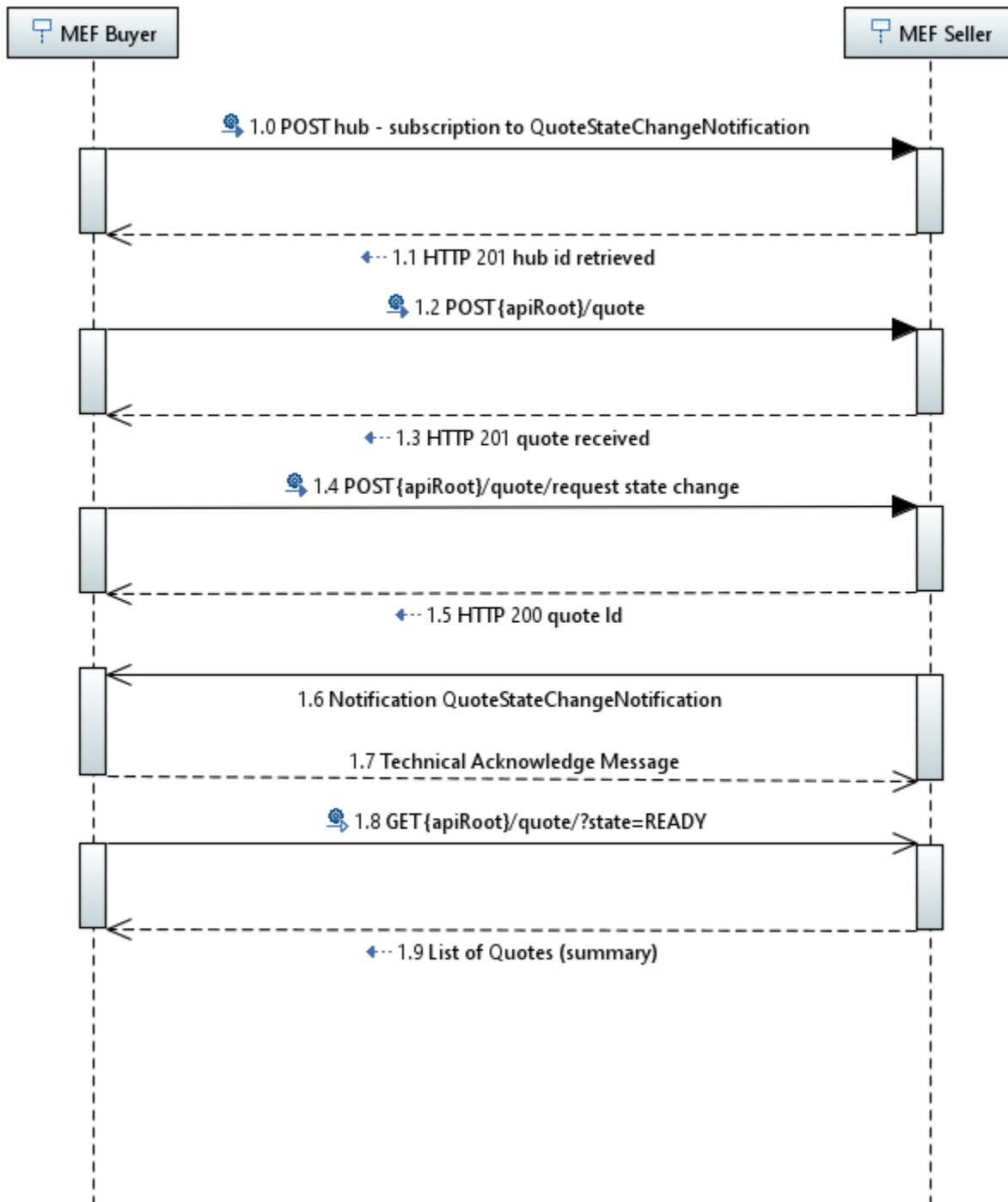


Figure 4 - Quote Management API Interactions

8.2 Operations

8.2.1 Create Quote

POST serverRoot/api/mef/quoteManagement/v1/quote

Description

This operation creates a quote entity.

Behavior

Standard 201 response if quote is created.

Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity (see below)

Specific business errors will be encapsulated in HTTP Response 422 Unprocessable entity:

- 100: Not able to provide Quote with Sync response
- 101: A relatedPartyRole for Buyer role must be provided
- 103: A relatedPartyRole is incomplete (must have partyRole.id or role.id+relatedParty)
- 104: A relatedParty is incomplete (must have a party.id or a party.name)
- 105: Qualification Id provided did not exist or expired
- 106: At least a productOffering Id or a product.id or a productSpec.id must be provided in quote item
- 107: inconsistency between requestedQuoteCompletionDate and expectedFulfillmentStartDate

Usage Sample

Request:

```
POST serverRoot/api/mef/quoteManagement/v1/quote
Content-Type: application/json
{
  "externalId": "ORGE456",
  "projectId": "ORGE",
  "quoteLevel": "FIRM",
  "instantSyncQuoting": false,
  "description": "Quote for an Access E-Line product",
```



```

428 "requestedQuoteCompletionDate": "2018-10-12T14:15:08.843Z",
429 "expectedFulfillmentStartDate": "2018-10-12T14:15:08.843Z ",
430 "agreement": [
431   {
432     "id": "22",
433     "name": "MSA",
434     "path": "https://mydoc/agreement/sp3/agreementV2"
435   }
436 ],
437 "relatedPartyRole": [
438   {
439     "id": "48",
440     "role": "Buyer",
441     "relatedParty": {
442       "id": "50",
443       "@referredType": "Organization",
444       "name": "Orange",
445       "number": "+330647389207"
446     }
447   }
448 ],
449 "quoteItem": [
450   {
451     "id": "52",
452     "action": "INSTALL",
453     "productOffering": {
454       "id": "COLT Access E-Line "
455     },
456     "product": {
457       "productSpecification": {
458         "id": "209",
459         "describing": {
460           "@type": "E-Line Spec",
461           "@schemaLocation": "{MEF Product Spec
462 Location}/ElineSpec_v2.json "
463         }
464       },
465       "productRelationship": [
466         {
467           "type": "RELIES_ON",
468           "product": {
469             "id": "334"
470           }
471         },
472         {
473           "type": "RELIES_ON",
474           "product": {
475             "id": "48"
476           }
477         }
478       ],
479       "place": [
480         {
481           "id": "392",
482           "role": "UNISite",
483           "@referredType": "FormattedAddress",

```

```
484         "@schemaLocation": "{MEF Address
485 Location}/FormattedAddress.json "
486     }
487 ]
488 },
489 "qualification": {
490     "id": "78",
491     "href": "
492 serverRoot/api/mef/productOfferingQualificationManagement/v1/productOfferingQu
493 alification/78",
494     "qualificationItem": "1",
495     "@referredType": "ProductOfferingQualification"
496 },
497 "relatedPartyRole": [
498     {
499         "id": "30",
500         "role": "Notification Contact",
501         "relatedParty": {
502             "id": "62",
503             "@referredType": "Individual",
504             "name": "Claude Monet",
505             "emailAddress": "claudemonet@orange.fr",
506             "number": "+330629382913",
507             "numberExtension": ""
508         }
509     }
510 ]
511 }
512 ]
513 }
```

Response:

```
516
517
518 201
519 {
520     "id": "456789"
521     /// Complete quote representation
522 }
523
```

8.2.2 Retrieve Quotes

GET serverRoot/api/mef/quoteManagement/v1/quote?(filter criteria)

Description

This operation is used to retrieve quotes corresponding to search criteria.

The response will be a quote summary.

529 Only the following attributes can be used as search criteria.

- 530 • externalId
- 531 • quoteDate
- 532 • state
- 533 • quoteLevel
- 534 • quoteCompletionDate
- 535 • projectId
- 536 • offset (requested index for start of resources to be provided in response requested by
- 537 client)
- 538 • limit (Requested number of resources to be provided in response requested by client)

539 Only the following attributes will be retrieved in a summary view:

- 540 • id
- 541 • externalId
- 542 • quoteLevel
- 543 • description
- 544 • quoteDate
- 545 • state
- 546 • projectId
- 547 • requestedQuoteCompletionDate
- 548 • expectedQuoteCompletionDate
- 549 • effectiveQuoteCompletionDate

550 Behavior

- 551 • Returns HTTP/1.1 status code 200 if the request was successful

552 Note: if no quote matches the criteria, an empty list is retrieved with a 200 status code (not
553 considered as a fail)

554 Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity (see below)

555 Specific business errors will be encapsulated in HTTP Response 422 Unprocessable entity:

- 556 • 100: Too many records retrieved - please restrict requested parameter value(s)

557

Usage Sample

Request:

```
GET serverRoot/api/mef/quoteManagement/v1/quote?state=ACCEPTED&projectId=ORGE
&orderDate.gt=2018-06-16T00%3A00%3A00.000Z
Accept: application/json
```

Response:

```
200
[
  {
    "id": "123456",
    "href": "serverRoot/api/mef/quoteManagement/v1/123456",
    "externalId": "ORGE123",
    "quoteLevel": "BUDGETARY",
    "description": "Quote for a UNI",
    "quoteDate": "2018-07-10T15:19:14.799Z",
    "state": "ACCEPTED",
    "projectId": "ORGE",
    "requestedQuoteCompletionDate": "2018-07-12T15:19:14.799Z",
    "expectedQuoteCompletionDate": "2018-07-11T15:19:14.799Z",
    "effectiveQuoteCompletionDate": "2018-07-11T13:14:18.799Z"
  },
  {
    "id": "456789",
    "href": "serverRoot/api/mef/quoteManagement/v1/456789",
    "externalId": "ORGE456",
    "quoteLevel": "FIRM",
    "description": "Quote for an Access E-Line product ",
    "quoteDate": "2018-10-09T14:15:08.843Z",
    "state": "ACCEPTED",
    "projectId": "ORGE",
    "requestedQuoteCompletionDate": "2018-10-12T14:15:08.843Z",
    "expectedQuoteCompletionDate": "2018-10-12T14:15:08.843Z",
    "effectiveQuoteCompletionDate": "2018-10-12T10:03:08.843Z "
  }
]
```

8.2.3 Retrieve a Single Quote by Quote Identifier

```
GET serverRoot/api/mef/quoteManagement/v1/quote/{id}
```

Description

597 This operation is used to retrieve a quote entity.

598 **Behavior**

- 599 • Returns HTTP/1.1 status code 200 if the request was successful.

600 Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity (see below)

601 **Usage Sample**

602 **Request:**

```
GET serverRoot/api/mef/quoteManagement/v1/quote/456789
Accept: application/json
```

603 **Response:**

604 See JSON illustrating quote [resource](#)

605 **8.2.4 Cancel or Reject Quote**

606 POST serverRoot/api/mef/quoteManagement/v1/quote/requestStateChange

607 **Description**

608 Request from the Buyer to cancel or Reject a quote.

609 When the Seller receives the cancel request, the Seller will change the quote state to
610 CANCELLED (no change on order item state). When the Seller receives a reject request, the
611 Seller will change the quote state to REJECTED (no change on order item state)

612 **Behavior**

613 Standard 200 response if the quote state is successfully cancelled or rejected.

614 Otherwise:

615

400	Bad Request
401	Unauthorized

403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity (see below)

616 Specific business errors will be encapsulated in HTTP Response 422 Unprocessable entity:

- 617 • 100: Quote current status is incompatible with requested quote state change
- 618 • 101: Quote external Id provided did not match

619 Usage Sample

620 Request:

```
621 POST serverRoot/api/mef/quoteManagement/v1/quote/requestStateChange
622 Content-Type: application/json
623 {
624     "id": "291348",
625     "externalId": "ORGE285",
626     "state": "CANCELLED",
627     "quoteChangeStateReason": "No longer required"
628 }
629
```

630 Response:

631 Cancellation request accepted:

```
632 200
633 {
634     "id": "291348",
635     "externalId": "ORGE285",
636     "quoteEffectiveStateChangeDate": "2018-07-11T15:19:14.799Z",
637     "state": "CANCELLED"
638 }
639
```

640

641