



## **MEF 80 Draft (R1)**

### **Product Quotation Requirements and Use Cases**

**January 2019**

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

This draft document represents MEF work in progress, has not achieved full MEF standardization and is subject to change. There are known unresolved issues that are likely to result in changes before this becomes a fully endorsed MEF Standard. The reader is strongly encouraged to review the [Release Notes](#) when making a decision on adoption. Additionally, because this document has not been adopted as a Final Specification in accordance with MEF's Bylaws, Members are not obligated to license patent claims that are essential to implementation of this document under MEF's Bylaws.

## Disclaimer

© MEF Forum 2019. All Rights Reserved.

This draft document represents MEF work in progress, has not achieved full MEF standardization and is subject to change. There are known unresolved issues that are likely to result in changes before this becomes a fully endorsed MEF Standard. The reader is strongly encouraged to review the [Release Notes](#) when making a decision on adoption. Additionally, because this document has not been adopted as a Final Specification in accordance with MEF's Bylaws, Members are not obligated to license patent claims that are essential to implementation of this document under MEF's Bylaws.

The information in this publication is freely available for reproduction and use by any recipient and is believed to be accurate as of its publication date. Such information is subject to change without notice and MEF Forum (MEF) is not responsible for any errors. MEF does not assume responsibility to update or correct any information in this publication. No representation or warranty, expressed or implied, is made by MEF concerning the completeness, accuracy, or applicability of any information contained herein and no liability of any kind shall be assumed by MEF as a result of reliance upon such information.

The information contained herein is intended to be used without modification by the recipient or user of this document. MEF is not responsible or liable for any modifications to this document made by any other party.

The receipt or any use of this document or its contents does not in any way create, by implication or otherwise:

- a) any express or implied license or right to or under any patent, copyright, trademark or trade secret rights held or claimed by any MEF member which are or may be associated with the ideas, techniques, concepts or expressions contained herein; nor
- b) any warranty or representation that any MEF members will announce any product(s) and/or service(s) related thereto, or if such announcements are made, that such announced product(s) and/or service(s) embody any or all of the ideas, technologies, or concepts contained herein; nor
- c) any form of relationship between any MEF member and the recipient or user of this document.

Implementation or use of specific MEF standards, specifications, or recommendations will be voluntary, and no Member shall be obliged to implement them by virtue of participation in MEF Forum. MEF is a non-profit international organization to enable the development and worldwide adoption of agile, assured and orchestrated network services. MEF does not, expressly or otherwise, endorse or promote any specific products or services.

## Table of Contents

<b>1</b>	<b>List of Contributing Members</b> .....	<b>6</b>
<b>2</b>	<b>Abstract</b> .....	<b>6</b>
<b>3</b>	<b>Release Notes</b> .....	<b>6</b>
<b>4</b>	<b>Terminology and Acronyms</b> .....	<b>7</b>
<b>5</b>	<b>Scope</b> .....	<b>10</b>
<b>6</b>	<b>Compliance Levels</b> .....	<b>11</b>
<b>7</b>	<b>Introduction</b> .....	<b>12</b>
<b>8</b>	<b>Requirements</b> .....	<b>13</b>
<b>9</b>	<b>Quote Use Cases and Business Process Definitions</b> .....	<b>14</b>
9.1	High-Level Use Cases .....	14
9.2	Quote Use Cases .....	14
<b>10</b>	<b>Quote Attributes</b> .....	<b>20</b>
<b>11</b>	<b>State Diagrams</b> .....	<b>32</b>
11.1	Quote Process Flow .....	32
11.2	Quote Item Process Flow.....	33
<b>12</b>	<b>References</b> .....	<b>35</b>

### List of Figures

Figure 1 - Quote Use Cases ..... 15  
Figure 2 - Quote Process Flow..... 32  
Figure 3 - Quote Item Process Flow ..... 34



### List of Tables

Table 1 - Contributing Member Companies ..... 6  
Table 2 - Terminology and Abbreviations..... 10  
Table 3 - Use Case Table ..... 15  
Table 4 - Request Quote ..... 16  
Table 5 - Retrieve Quote List..... 17  
Table 6 - Retrieve Quote by Id ..... 18  
Table 7 - Cancel or Reject Quote..... 18  
Table 8 - Quote Notifications ..... 19  
Table 9 - Quote Attributes ..... 31  
Table 10 – Quote State Values..... 33  
Table 11 – Quote Item State Values ..... 34

## 1 List of Contributing Members

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

Member Company

Table 1 - Contributing Member Companies

## 2 Abstract

This specification identifies the common quote attributes and processes needed to support inter-carrier quote management. It supports the requirements defined in the MEF Lifecycle Service Orchestration (LSO) Reference Architecture and Framework (MEF 55, “LSO RA”) requirements for Quotes over the Sonata interface (Service Provider <-> Partner interactions). Information contained within this specification will be utilized by both Buyer and Seller quote systems for the development of automated API systems.

## 3 Release Notes

The following issues have been deferred to a later release of this standard. They are not addressed in this document.

1. Change Use Cases to Buyer perspective. As examples, "CreateQuote" should be "Request Quote" or "Request New Quote", "Retreive Quote by Id" should be "Retreive Quote",
2. Missing Buyer Use Case for "Receive Quote Notifications" or "Subscribe and Receive Quote Notifications" Supplier Use Case should be "Send Quote Notifications"

3. Add Use Cases where Seller's Product Catalog is visible to Buyers.
4. Add Post Conditions that describe what the end state is from the perspective of the Buyer.
5. The term QuoteStatus needs to be clearly described and defined in the document.
6. The term QuoteLevel needs to be clearly described and defined in the document.
7. Add behavioral logic to describe instantSyncQuote possibly including state machines.
8. Should unitOfMeasure be standardized as an enum? The Commercial Attributes Team may be the best to resolve this.
9. A description of how the Quote Attribute type is used is needed.
10. Provide common Business Requirements document that moves requirements that are copied in each Sonata Pre-Ordering Business Requirements standard are put in Common Business Requirements document.

#### **4 Terminology and Acronyms**

This section defines the terms used in this specification. In many cases, the normative definitions to terms are found in other documents. In these cases, the third column is used to provide the reference that is controlling, in other MEF or external documents.

<b>Term</b>	<b>Definition</b>	<b>Reference</b>
Access E-Line	An E-Access Service, based on the O-Line Service definition.	MEF 51
Application Programming Interface (API)	In the context of Lifecycle Service Orchestration (LSO), API describes one of the Management Interface Reference Points based on the requirements specified in an Interface Profile, along with a data model, the protocol that defines operations on the data and the encoding format used to encode data according to the data model.	MEF 55
Buyer	Using MEF 55 terminology, a Buyer may be a Customer or a Service Provider who is buying from a Partner. For the purposes of this specification, a Buyer is the Service Provider who is requesting and retrieving Quotes from a Partner (aka, Seller).	MEF 55



Term	Definition	Reference
Carrier Ethernet Network	A network from a Service Provider or network operator supporting the MEF service and architecture models.	MEF 12.1
Customer	A Customer is the organization purchasing, managing, and/or using Connectivity Services from a Service Provider. This may be an end-user business organization, mobile operator, or a partner network operator.	MEF 55
ENNI	A reference point representing the boundary between two Operator networks that are operated as separate administrative domains.	MEF 26.2
Instantaneous Synchronous Quote	An Instantaneous Synchronous Quote is a quote provided immediately upon receipt of the quote request.	This document
O-Line Service	A General OVC Service that uses a Point-to-Point OVC.	MEF 51
OVC Endpoint	A logical entity at a given External Interface that is associated with a distinct set of frames passing over that External Interface i.e., UNI, ENNI.	MEF 26.2
Partner	An organization providing Products and Services to the Service Provider (Buyer) to allow the Service Provider to instantiate and manage products external to the Service Provider domain.	MEF 55
Product	A Product represents the subscription of a Product Offering by a Party playing a PartyRole such as a Customer.	TMF GB922
Product Offering	An externally facing representation of a Service and/or Resource procurable by the Customer.	TMF GB922
Product Specification	Represents a specification as perceived by the business user and specifies what the marketing operator wants to sell at a functional level.	TMF GB922
Budgetary Quote	A quote that is provided quickly and with very little analysis such that the buyer can get an idea of how much the requested service could cost. Ordering is not possible based on a budgetary quote.	This document

Term	Definition	Reference
Indicative Quote	A quote that is provided to the buyer based on some, but not a complete, pre-order analysis. At this stage there is further analysis that the seller can (and is willing) to undertake to provide a committed or firm price, but the seller needs some time to complete this. Ordering may be possible based on the indicative quote with some stipulations as to how cost identified uncovered during delivering. Some fees on an indicative quote may be firm.	This document
Firm Quote	A quote provided to the buyer based on as rigorous a pre-order analysis as the seller is willing to carry out. All fees specified on a firm quote are committed and thus cannot be modified or more charges added through the ordering process.	This document
Quote Attribute Value	A value assigned to a quote attribute	This document
Seller	Using MEF 55 terminology, a Seller may be a Service Provider or a Partner who is providing products to a Buyer.	This document
Service Provider	The organization providing Ethernet Service(s).	MEF 10.3
UNI	The physical demarcation point between the responsibility of the Service Provider and the responsibility of the Customer.	MEF 10.3

**Table 2 - Terminology and Abbreviations**

## 5 Scope

This specification defines the process for MEF Carrier Ethernet Quote Management between a Partner/Access Provider (Seller) and Service Provider (Buyer). At this time this specification is focused on Access E-Line services as defined in MEF 51. In the future this specification will remove references to specific services. The requirements for Quote Management will be developed following a UML process approach which includes, but is not limited to, Business Process Flows, Use Cases, Scenarios, Information Models, and State Machine Diagrams. This specification is limited to the business process requirements depicted as Use Cases and attribute definitions needed for Quote Management. It will be the basis of requirements for a Quote Data Model and API.

## 6 Compliance Levels

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this specification are to be interpreted as described in BCP 14 (RFC 2119, RFC 8174) when, and only when, they appear in all capitals, as shown here. All key words must be in bold text.

Items that are **REQUIRED** (contain the words **MUST** or **MUST NOT**) are labeled as [**Rx**] for required. Items that are **RECOMMENDED** (contain the words **SHOULD** or **SHOULD NOT**) are labeled as [**Dx**] for desirable. Items that are **OPTIONAL** (contain the words **MAY** or **OPTIONAL**) are labeled as [**Ox**] for optional.

## 7 Introduction

This specification defines the business requirements and process-related guidelines for the Product Quote process over the Sonata interface. The Sonata interface is defined in MEF 55 as the Management Interface Reference Point supporting the management and operations interactions (e.g., ordering, billing, trouble management, etc.) between two network providers (e.g., Service Provider Domain and Partner Domain). The scope of this specification is limited to interactions between these parties; within this specification, they are referred to as the “Buyer” and the “Seller”.

There are 3 associated “patterns” to the interactivity between the Buyer and Seller when the Buyer issues a Quote request:

1. The Seller may respond immediately with the results of the request
2. The Seller may acknowledge that he got the request, will process it, and send notifications to update the Buyer on the status (assuming the Buyer has subscribed to receive the notifications)
3. The Seller may indicate he is unable to process the request

To fully define the business interactions associated with inter-carrier quotes, this specification is focused on the following key areas:

- [Quote Use Cases](#) and Business Process Definitions
- Specific [Quote attributes](#) supported in this specification and
- [State Diagrams](#) for Quotes.

## 8 Requirements

R1: A Buyer MUST support the Buyer side of all [use cases](#) described in this specification.

R2: A Seller MUST support the Seller side of all use cases described in this specification.

R3 A Buyer's request MUST contain all [quote attributes](#) as specified in this specification as "requests" per use case.

R4: A Seller's response MUST contain all quote attributes as specified in this specification as "responses" per use case.

R5 The Seller MUST support all the states and their associated state transitions as specified in the [quote](#) and [quote item](#) state machines.

## 9 Quote Use Cases and Business Process Definitions

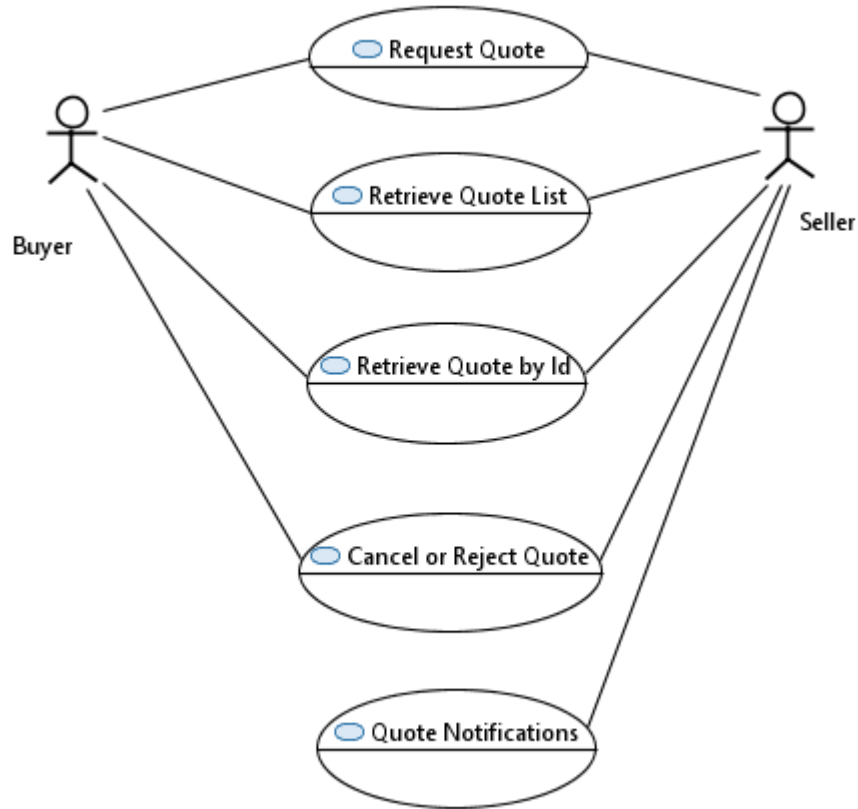
### 9.1 High-Level Use Cases

This section provides the complete set of Use Cases needed to support Product Quote Management and expands on the quote process defined in MEF 50.1 (MEF Services Lifecycle Process Flows). These Use Cases are based on business process standards of interactivity between Buyers and Sellers of Products. The specific attributes associated with each Use Case are defined in Section [Quote attributes](#). Prior arrangements for Buyer authentication, security verification and system interface requirements are not addressed within these use cases. All onboarding requirements must be defined and negotiated between the Buyer and Seller prior to the creation and retrieval of quotes.

The Buyer might have done a serviceability check as specified in the [Serviceability Technical Specification](#) prior to the process of establishing a quote. The Seller might reject a request for a quote if a serviceability reference is not provided. The Quote functionality is not defined in regard to any particular product, and thus the Buyer should be able to get a quote on any of the products supported by the Seller. The characteristics of the product are found in an associated product specification. The MEF supported product specifications are located on the [MEF GitHub](#).

### 9.2 Quote Use Cases

This section defines the use cases that support Quote Management.



**Figure 1 - Quote Use Cases**

Use Case #	Use Case Name	Use Case Description
1	Request Quote	The Buyer requests a Product Quote from the Seller.
2	Retrieve Quote List	The Buyer requests a list of Product Quotes from the Seller based on Product Quote filter criteria.
3	Retrieve Quote by Id	The Buyer requests a single Product Quote based on a Quote identifier.
4	Cancel or Reject Quote	The Buyer requests to Cancel or Reject a Product Quote that is in-progress.
5	Quote Notifications	The Seller sends the following types of notifications to the Buyer who has subscribed to these notifications <ul style="list-style-type: none"> <li>• Quote creation</li> <li>• Quote state change</li> <li>• Quote attribute value change</li> </ul>

**Table 3 - Use Case Table**

This section defines the details for each Quote use case.

Field	Description
Use Case Number	1
Use Case Name	Request Quote
Description	The Buyer requests a Product Quote from the Seller
Actors	Buyer/Seller
Pre-Conditions	<ol style="list-style-type: none"> <li>1. Buyer must be authorized to purchase products from the Seller (Buyer on-boarded)</li> <li>2. Buyer may have completed pre-order serviceability.</li> <li>3. Any prerequisite services are in place between the Buyer and Seller.</li> </ol>
Process Steps	<ol style="list-style-type: none"> <li>1. The Buyer initiates and submits a request for a quote.</li> <li>2. The Seller validates the quote request based on business validation rules and pre-conditions.</li> <li>3. The Seller verifies the requested date and time by which a response is to be generated.</li> <li>4. The Seller verifies the pre-order serviceability reference.</li> <li>5. The Seller begins to work on the Quote.</li> <li>6. If the Seller is able to quickly determine the Quote, and the Buyer has requested an “instantaneous synchronous quote”, the Seller may respond with the Quote, otherwise just a Quote Identifier is returned.</li> </ol>
Post-Conditions	The Buyer obtains either a Quote or a Quote Identifier. If a Quote Identifier is received, the Buyer is waiting for a notification from the Seller that the Quote is available.
Alternative Paths	<ol style="list-style-type: none"> <li>1. If the Seller requires that a Serviceability reference be provided, and it is absent, he may reject the quote request.</li> <li>2. If the Seller cannot meet the Quote deadline, a response is returned indicating the deadline cannot be met, and that a quote will not be generated. The Seller can provide a date by which the quote can be provided.</li> </ol>
Business Process	MEF 50.1 Order-to-Delivery

**Table 4 - Request Quote**

Field	Description
Use Case Number	2
Use Case Name	Retrieve Quote List
Description	The Buyer requests a list of Product Quotes from the Seller based on Product Quote filter criteria
Actors	Buyer/Seller



Pre-Conditions	<ol style="list-style-type: none"> <li>1. The Buyer knows which filtering attributes to specify. The filter includes the following attributes: <ul style="list-style-type: none"> <li>• externalId</li> <li>• quoteDate</li> <li>• state</li> <li>• quoteLevel</li> <li>• quoteCompletionDate</li> <li>• projectId</li> </ul> </li> <li>2. The Buyer may also request to quotes starting at a specific index by specifying an “offset”, or to limit the number of quotes returned by specifying a “limit”.</li> </ol>
Process Steps	<ol style="list-style-type: none"> <li>1. The seller receives the request and validates that the filter is well formulated.</li> <li>2. The seller determines if there are any quotes that match the filter criteria.</li> <li>3. The seller returns a list of summarized quote instances. The summary data for each quote instance includes: <ul style="list-style-type: none"> <li>• id</li> <li>• externalId</li> <li>• quoteLevel</li> <li>• description</li> <li>• quoteDate</li> <li>• state</li> <li>• projectId</li> <li>• requestedQuoteCompletionDate</li> <li>• expectedQuoteCompletionDate</li> <li>• effectiveQuoteCompletionDate</li> </ul> </li> </ol>
Post-Conditions	Buyer has received list of summarized quotes.
Alternative Paths	<ol style="list-style-type: none"> <li>1. The Seller will send an error if an error is encountered during processing. The Buyer may send a new request.</li> <li>2. If the Buyer has specified an “offset”, or “limit”, only those quotes that correspond to the offset or limit will be returned.</li> <li>3. The Seller returns an empty list if there are no quotes that meet the filter criteria.</li> </ol>
Business Process	MEF 50.1 Order-to-Delivery

**Table 5 - Retrieve Quote List**

Field	Description
Use Case Number	3
Use Case Name	Retrieve Quote by Id
Description	The Buyer requests a single Product Quote based on a Quote identifier.

Actors	Buyer Seller
Pre-Conditions	1. Buyer knows the identifier of the product quote instance to be retrieved.
Process Steps	<ol style="list-style-type: none"> <li>1. The seller receives the request and validates the identifier.</li> <li>2. The seller determines if there is a quote instance that matches the identifier.</li> <li>3. The seller returns the matching quote instance with all the attributes.</li> </ol>
Post-Conditions	None
Alternative Paths	<ol style="list-style-type: none"> <li>1. The Seller will return an error message if an error is encountered during processing.</li> <li>2. The Seller will return an error if the quote instance with the specified quote identifier is not found.</li> </ol>
Business Process	MEF 50.1 Order-to-Delivery

**Table 6 - Retrieve Quote by Id**

Field	Description
Use Case Number	4
Use Case Name	Cancel or Reject Quote
Description	The Buyer requests to Cancel or Reject a Product Quote that is in-progress.
Actors	Buyer Seller
Pre-Conditions	<ol style="list-style-type: none"> <li>1. The quote to be Cancelled or Rejected exists in the Seller's system.</li> <li>2. For a Cancel request the Seller is processing the Quote. For a Reject request the Seller has completed the Quote.</li> </ol>
Process Steps	<ol style="list-style-type: none"> <li>1. The Seller receives the request for cancellation or rejection of a quote through a state change.</li> <li>2. Seller verifies that the referenced Quote exists.</li> <li>3. Seller verifies that the current Quote state allows the transition to cancelled or rejected.</li> <li>4. If an external ID is present in the request, the Seller verifies that ID is consistent with the external ID in the quote.</li> <li>5. The quote is cancelled or rejected.</li> </ol>
Post-Conditions	None
Alternative Paths	<ol style="list-style-type: none"> <li>1. The seller will send an error if the quote to be cancelled or rejected does not exist.</li> <li>2. The seller will send an error if the external id in the request is not consistent with the external id in the quote.</li> <li>3. The Seller will send an error if he is unable to Cancel or Reject the quote.</li> </ol>
Business Process	MEF 50.1 Order-to-Delivery

**Table 7 - Cancel or Reject Quote**

Field	Description
Use Case Number	5
Use Case Name	Quote Notifications
Description	The Seller sends notifications for the following qualifying events: quote creation, quote state change, and quote attribute value change.
Actors	Seller
Pre-Conditions	<ol style="list-style-type: none"> <li>1. One of the qualifying events has occurred.</li> <li>2. A Buyer must have subscribed to notifications.</li> </ol>
Process Steps	<ol style="list-style-type: none"> <li>1. A notification is created for one of the following types of events: quote creation, quote state change, or quote attribute value change</li> <li>2. The Seller sends the notification to the location requested by the Buyer</li> </ol>
Post-Conditions	The Seller has sent quote related notification.
Alternative Paths	None
Business Process	MEF 50.1 Lead-Response-to-Contract

**Table 8 - Quote Notifications**

## 10 Quote Attributes

This section identifies the attributes needed for each of the Quote Use Cases defined above. The “Requirements” specified below are only defined in the context of Product Quotes; all characteristics of MEF-defined attributes should be referenced in the appropriate MEF Technical Specification document.

It is possible that individual Sellers may require additional attributes for their unique product offerings and the ability to extend the technical implementation of these requirements to allow for Buyer-Seller specific attributes should be accommodated but not mandated by the implementation design.

The columns in the table are as follows:

- **Attribute**      The name of the attribute
- **Description**      A short description of the attribute
- **Type**      String, integer, enumerations, or reference to another entry in the table
- **Comments**      Comments about the attribute
- **UC**      The last two columns in the table represent use cases as defined in this specification, with each column having two entries, one for the “Req – Request” and one for the “Res – Response”. For each one there is an indication of whether the attribute may be present or not (Y|N), and whether it is mandatory or optional (M|O) when specified.
  - N=NO
  - Y=YES
  - M=MANDATORY
  - O=OPTIONAL

For example, for Quote, the quoteLevel is listed as YO| YO for UC2, which means it is optionally in the request and may also be optionally in the response. Similarly, for UC3, it is listed as N | YM which means it is not in the request but must be in the response.

Note: The requests are issued by the Buyer, and the responses are returned by the Seller.



MEF 80 Draft (R1) - Product Quotation

Attributes	Description	Type	Comments	UC1 Req  Res	UC2 Req  Res	UC3 Req  Res	UC4 Req  Res
<b>Quote</b>							
id	Unique (within the quoting domain) identifier for the quote, as attributed by the quoting system.	String	The identifier is created by the Seller when the product quote instance is created	N YO	N YO	Y YO	YM YM
externalId	ID given by the Buyer and only understandable by him (to facilitate his searches afterwards).	String	The Seller may have a specific policy such as: "When cancelling a quote, the externalId on the request must match the externalId of the quote." However, this is not mandatory. Set by the Buyer	YO YO	YO YO	N YO	YO YO
projectId	A project id associated to the Quote	String	Set by the Buyer.	YO YO	YO YO	N YO	N N
description	Description of the Quote.	String	Set by the Buyer	YO YO	N YO	N YO	N N
state	The state of the Quote.	QuoteStatus	The type is an enumeration with values: <ul style="list-style-type: none"> <li>• IN_PROGRESS</li> <li>• CANCELLED</li> <li>• UNABLE_TO_PROVIDE</li> <li>• READY</li> <li>• REJECTED</li> <li>• ACCEPTED</li> <li>• EXPIRED</li> </ul> Set by the Seller	N YM	YO YM	N YM	YM YM

quoteDate	Date when the quote was created	DateTime	This value is set by the Seller.	N YO	YO YO	N YO	N N
effectiveQuoteCompletionDate	Date when the quoted was Cancelled, Rejected or Accepted.	DateTime	This value is set by the Seller.	N YO	YO YO	N YO	N N
expectedFulfillmentStartDate	Date when product in the quote should be available.	DateTime	This value is set by the Seller.	YO YO	N N	N YO	N N
expectedQuoteCompletionDate	This is the date filled by the seller to indicate expected quote completion date.	DateTime	This value is set by the Seller.	N YO	N YO	N YO	N N
validFor	The time period for which this quote is valid.	TimePeriod	The time period contains two attributes and is set by the Seller <ul style="list-style-type: none"> <li>ValidFrom</li> <li>ValidTo</li> </ul>	N YO	N N	N YO	N N
quoteLevel	An indication of whether the quote is budgetary, indicative, or firm.	QuoteLevel	Quote level contains the possible values and is set by the Buyer <ul style="list-style-type: none"> <li>BUDGETARY</li> <li>INDICATIVE</li> <li>FIRM</li> </ul>	YO YM	YO YO	N YM	N N
instantSyncQuoting	If this flag is set to True, Buyer requests to have instant quoting to be provided in the response for creation of a quote. If true, the requestedQuoteCompletionDate is ignored.	Boolean	Set by the Buyer. If set to false, the Seller does not have to provide an instant quote. If set to true, and the Seller can't accommodate the request, an error is returned. If an error is returned, the quote process is	YO YM	N N	N YM	N N



MEF 80 Draft (R1) - Product Quotation

			stopped.				
request- edQuoteComple- tionDate	This is the date de- sired by the requester to have the quote completed (meaning priced).	DateTime	Set by the Buyer	YM YM	N YM	N YM	N N
quoteChangeSta- teReason	The reason a Buyer is changing a quote state	String	Only used on request to cancel or reject as quote. Set by the Buyer	N N	N N	N N	YM N
quoteEffec- tiveStateChangeDate	The date the Seller essentially accepted to change the state as set by the Buyer.	DateTime	The Buyer is able to “Can- cel” or “Reject” a quote by changing the state of the quote. Set by the Buyer.	N N	N N	N N	N YM
note	A set of unstructured notes associated to the quote.	Reference to a Note	The notes may be defined by the Buyer or Seller	See Note	See Note	See Note	See Note
relatedPartyRole	Related party roles associated to the quote.	Reference to a Related Party Role	One of the related parties must be a "notification con- tact", the contact attached to the quote to send back in- formation regarding this quote. Another related party is the "customer". Set by the Buyer and Seller	See Related Party Role	See Related Party Role	See Related Party Role	See Related Party Role
quoteItem	A list of associated quote items	Reference to a Quote Item		See Quote Item	See Quote Item	See Quote Item	See Quote Item
agreement	The agreement(s) as- sociated to the quote.	Reference to an Agreement		See Agree- ment	See Agree- ment	See Agree- ment	See Agree- ment
<b>Quote Item</b>							
quoteItemRefer- enceNumber	A buyer provided identifier to identify quote items and to be able to relate them to	String	This is set by the Buyer.	YM YM	N N	N YM	N N



MEF 80 Draft (R1) - Product Quotation

	one another.						
state	The state of the quote item	QuoteStatus	The type is an enumeration with values and is set by the Seller: <ul style="list-style-type: none"> <li>• IN_PROGRESS</li> <li>• UNABLE_TO_PROVIDE</li> <li>• READY</li> <li>• ABANDONED</li> </ul>	N YM	N N	N YM	N N
action	Action to be performed on this quote item. This corresponds to the order item action when an associated product is ordered.	QuoteAction	The type is an enumeration with values: <ul style="list-style-type: none"> <li>• INSTALL</li> <li>• CHANGE</li> <li>• DISCONNECT</li> <li>• NO_CHANGE</li> </ul> Set by the Buyer	YM YM	N N	N YM	N N
quoteItemPrice	Prices associated to the quote item.	Reference to a Quote Price		See Quote Price	See Quote Price	See Quote Price	See Quote Price
quoteItemTerm	The terms of the quote item	Reference to a Quote Item Term	Used to describe a term (also known as commitment) for a quote item	See Quote Item Term	See Quote Item Term	See Quote Item Term	See Quote Item Term
product	The product for which the quote is being made.	Reference to a Product		See Product	See Product	See Product	See Product
productOffering	The product offering associated to the product.	Reference to a Product Offering		See Product Offering	See Product Offering	See Product Offering	See Product Offering
quoteItemRelationship	The relationship between two quote items.	Quote Item Relationship		See Quote Item Relationship	See Quote Item Relationship	See Quote Item Relationship	See Quote Item Relationship
note	A set of unstructured notes associated to the	Reference to a Note	The notes may be defined by the Buyer or Seller	See Note	See Note	See Note	See Note





MEF 80 Draft (R1) - Product Quotation

	quote item						
qualification	The product offering qualification associated to this quote item.	Reference to a Qualification		See Qualification	See Qualification	See Qualification	See Qualification
relatedPartyRole	Related party roles associated to the quote.	Reference to a Related Party Role		See Related Party Role	See Related Party Role	See Related Party Role	See Related Party Role
<b>Product Offering</b>							
id	A unique product offering identifier.	String	This identifier is provided by the seller and communicated to the buyer during the on-boarding process.	N YM	N N	N YM	N N
<b>Product</b>							
id	A unique identifier of the product	String	A product that already exists in the inventory. The quote might be for a modification to an existing product.	YM YM	N N	N YM	N N
productSpecification	The Product Specification associated to the Product	Reference to a Product Specification	The product specification that describes the characteristics of this product.	See Product Specification	See Product Specification	See Product Specification	See Product Specification
productRelationship	The product has a product relationship with other product(s).	Reference to a Product Relationship	This provides the means to show relationships between the products being quoted	See Product Relationship	See Product Relationship	See Product Relationship	See Product Relationship
place	The Place(s) associated to the Product.	Reference to a Place	The places associated to the product provided at order time.	See place	See place	See place	See place
<b>Product Relationship</b>							
type	The type of relationship between products.	ProductRelationshipType	Enumeration. The possible values are:	YM YM	N N	N YM	N N

			<ul style="list-style-type: none"> <li>• BUNDLED</li> <li>• RELIES_ON</li> <li>• COMES_FROM</li> </ul>				
product	A reference to a product id.	Reference to a Product	The product to which another product is related.	YM YM	N N	N YM	N N
<b>Product Specification</b>							
id	A unique identifier of the product specification.	String	This is a reference to the associated product specification.	YM YM	N N	N YM	N N
<b>Related Party Role</b>							
id	A unique identifier of the related party role.	String		YO YO	N N	N YO	N N
role	The role of the related party.	String	These are roles such as "Notification Contact", or "Customer". "Buyer" and "Seller" are mandatory.	YM YM	N N	N YM	N N
relatedParty	The related party associated to this role	Reference to a Related Party	The related party may be set by the Buyer	See Related Party	See Related Party	See Related Party	See Related Party
<b>Related Party</b>							
id	A unique identifier of the related party.	String	These are the related parties that were associated with the quote. May be set by the Buyer or Seller. Only the Buyer can set Buyer information and only the Seller can set Seller information.	YO YO	N N	N YO	N N
name	Name of the related party.	String		YO YO	N N	N YO	N N



MEF 80 Draft (R1) - Product Quotation

emailAddress	The email address of the related party.	String		YO YO	N N	N YO	N N
telephoneNumber	The telephone number of the related party.	String		YO YO	N N	N YO	N N
numberExtension	The telephone number extension of the related party.	String		YO YO	N N	N YO	N N
<b>Agreement</b>							
id	Unique agreement identifier	String	This is a reference to an Agreement.	YM YM	N N	N YM	N N
name	Name of the agreement.	String	This is a reference to a name	YM YM	N N	N YM	N N
path	A URI/URL to where the agreement resides.	String	This is a reference to a path	YM YM	N N	N YM	N N
<b>Quote Price</b>							
name	Name of the quote/quote item price.	String	Set by the Seller	N YO	N N	N YO	N N
description	Description of the quote / quote item price.	String	Set by the Seller	N YO	N N	N YO	N N
priceType	Indicates if the price is for recurring or non-recurring charges.	PriceType	Set by the Seller	N YM	N N	N YM	N N
recurringCharge-Period	Used for a recurring charge to indicate period	ChargePeriod	Enumeration with the following values and is set by the Seller <ul style="list-style-type: none"> <li>• DAY</li> <li>• WEEK</li> <li>• MONTH</li> </ul>	N YO	N N	N YO	N N

			• YEAR				
unitOfMeasure	Unit of Measure, if price depends on it (Gb, SMS volume, etc..).	String	Set by the Seller	N YO	N N	N YO	N N
price	The associated price.	Reference to a Price	Set by the Seller	N YO	N N	N YO	N N
priceAlteration	The associated price alteration.	Reference to a Price Alteration	Set by the Seller	N YO	N N	N YO	N N
<b>Price</b>							
taxRate	The tax rate applied.	Float	Set by the Seller	N YM	N N	N YM	N N
taxIncludedAmount	All taxes included amount (expressed in the given currency).	Money	Money is defined as: <ul style="list-style-type: none"> <li>• value</li> <li>• unit</li> </ul> Set by the Seller	N YM	N N	N YM	N N
dutyFreeAmount	All taxes excluded amount (expressed in the given currency).	Money	Set by the Seller	N YM	N N	N YM	N N
priceRange	Price range describes a range of price (Min/Max) for budgetary or indicative quote.	Reference to a Price Range	Set by the Seller	N YO	N N	N YO	N N
priceVariation	Price variation describes a variation on the price for budgetary or indicative quote.	Float	Set by the Seller	N YO	N N	N YO	N N
<b>Price Alteration</b>							
name	A short descriptive name such as "Month-	String	Set by the Seller	N YM	N N	N YM	N N

	ly discount".						
description	A narrative that explains in detail the semantics of this quote item price alteration.	String	Set by the Seller	N YO	N N	N YO	N N
priceType	A category that describes the price such as recurring, one time and usage.	PriceType	Set by the Seller	N YM	N N	N YM	N N
unitOfMeasure	The unit of measure of the price alteration. Could be minutes, GB...	String	Set by the Seller	N YO	N N	N YO	N N
recurringCharge-Period	The periodicity of the recurring charge.	ChargePeriod	Enumeration with the following values: <ul style="list-style-type: none"> <li>• DAY</li> <li>• WEEK</li> <li>• MONTH</li> <li>• YEAR</li> </ul>	N YO	N N	N YO	N N
applicationDuration	Duration during which the alteration applies on the quote item price (for instance 2 months free of charge for the recurring charge).	Integer	Set by the Seller	N YO	N N	N YO	N N
priority	Priority level for applying this alteration among all the defined alterations on the order item price.	Integer	Set by the Seller	N YO	N N	N YO	N N
percentage	Percentage to apply	Float	Set by the Seller	N YO	N N	N YO	N N



MEF 80 Draft (R1) - Product Quotation

	for Product Offering Price Alteration						
price	Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for Price Alteration.	Reference to a Price	Set by the Seller	See price	See price	See price	See price
<b>Note</b>							
date	The date of the note.	DateTime	Set by Buyer or Seller. The Buyer creates a note when requesting the quote. The Seller may add notes.	YM YM	N N	N YM	N N
author	The author of the note.	String		YM YM	N N	N YM	N N
text	The text of the note.	String		YM YM	N N	N YM	N N
<b>Price Range</b>							
minTaxIncludedAmount	Minimum amount including tax.	Money	Money is defined as: <ul style="list-style-type: none"> <li>• value</li> <li>• unit</li> </ul> Set by Seller	N YO	N N	N YO	N N
maxTaxIncludedAmount	Maximum amount including tax.	Money	Set by Seller	N YO	N N	N YO	N N
minDutyFreeAmount	Minimum duty-free amount	Money	Set by Seller	N YO	N N	N YO	N N
maxDutyFreeAmount	Maximum duty-free amount	Money	Set by Seller	N YO	N N	N YO	N N
<b>Quote Item Relationship</b>							
id	ID of the related quote item (must be in the	String	Set by Buyer	YM YM	N N	N YM	N N

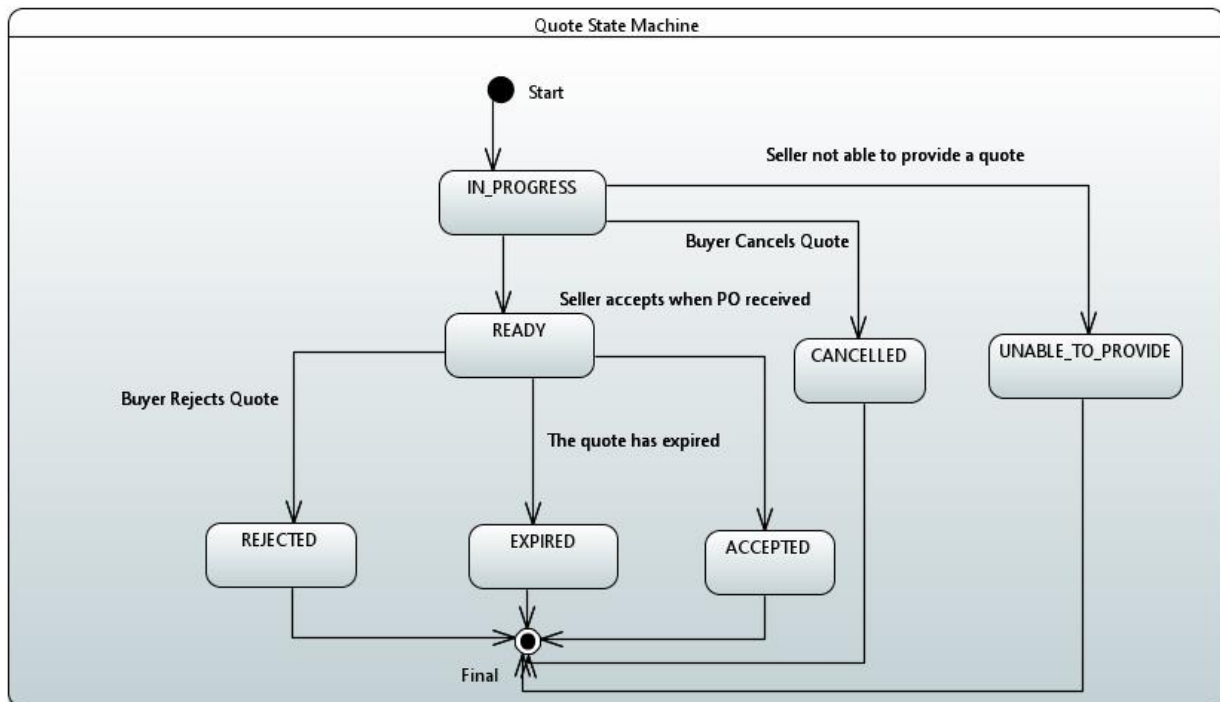
	same quote).						
type	Relationship type. For example, an E-Line quote item might “rely on” a UNI quote item.	RelationshipType	Enumeration. The possible values are: <ul style="list-style-type: none"> <li>• BUNDLED</li> <li>• RELIES_ON</li> <li>• COMES_FROM</li> </ul> Set by Buyer	YM YM	N N	N YM	N N
<b>Qualification</b>							
id	Id of the Product Offering Qualification	String	Reference to a POQ	N YM	N N	N YM	N N
qualificationItem	Id of the Product Offering Qualification Item	String	A unique identifier of the POQ item	N YM	N N	N YM	N N
<b>Quote Item Term</b>							
name	Name of the term	String	Set by the Seller	N YO	N N	N YO	N N
description	Description of the term	String	Set by the Seller	N YO	N N	N YO	N N
duration	Duration of the term	Duration	Set by the Seller	N YM	N N	N YM	N N

Table 9 - Quote Attributes

## 11 State Diagrams

### 11.1 Quote Process Flow

The Quote process flow is shown below. The diagram captures various states that the Quote goes through in its lifecycle. The specific states are managed by the Seller based on its processing and/or based on Buyer's action. If the Buyer subscribes to Quote state change notifications, he will receive a notification every time the state changes.



**Figure 2 - Quote Process Flow**

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.

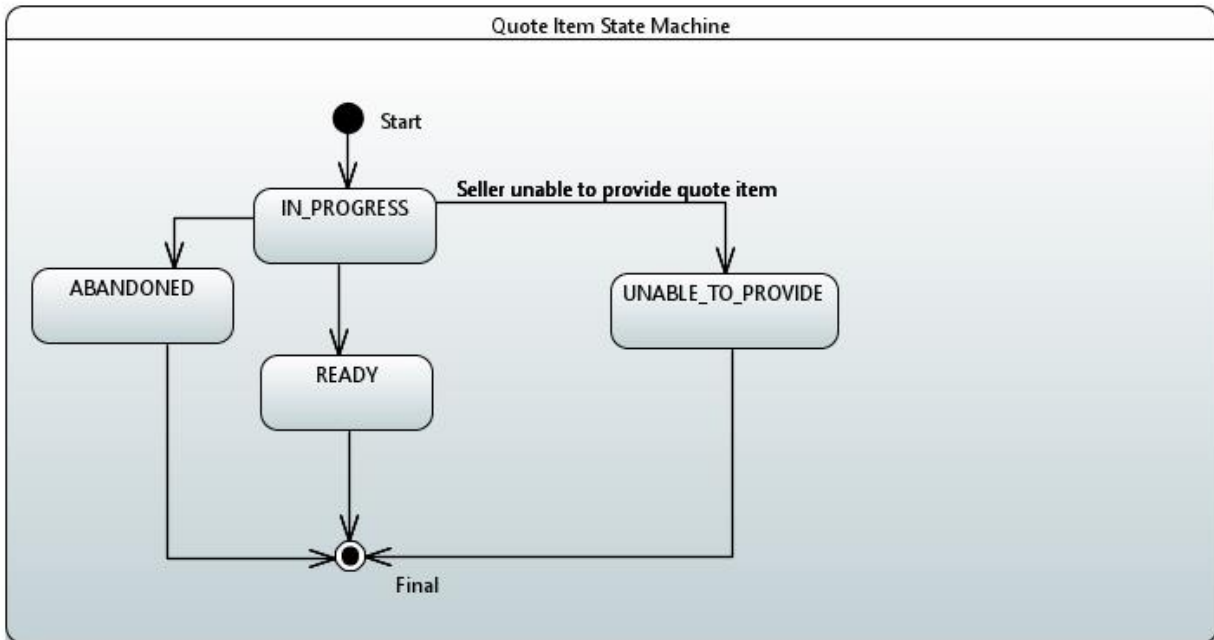


READY	The READY state is where the quote has been internally approved by the Seller and sent to the Buyer. The quote is no longer updatable. All quote items must be in a READY state. Note: future release of this specification may make quotes updatable in certain circumstances.
CANCELLED	A quote can only 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 not able 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 10 – Quote State Values**

**11.2 Quote Item Process Flow**

The Quote Item process flow is shown below. The diagram captures various states that the Quote Item goes through in its lifecycle. The specific states are managed by the Seller based on its processing and/or based on Buyer's action.



**Figure 3 - Quote Item Process Flow**

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 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 11 – Quote Item State Values**

## 12 References

Internet Engineering Task Force RFC 2119, *Key words for use in RFCs to Indicate Requirement Levels*, March 1997

Internet Engineering Task Force RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, May 2017

[MEF 50.1] MEF Forum, MEF Services Lifecycle Process Flows, MEF 50.1, August 2017.

[MEF 51] MEF Forum, OVC Services Definitions, August 2015.

[MEF 55] MEF Forum, LSO Reference Architecture, March 2016.

[TMF637] TM Forum, TMF637 Product Inventory Management API REST Specification R16.5.1, April 2017.

Serviceability Technical Specification (TS) Business Requirements and Use Cases, October 2018