Working Draft

MEF 110 Draft (R2)

Product Offering Availability and Pricing Discovery - Business Requirements and Use Cases

December 2023

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

Disclaimer

Table of Contents

List of Figures

List of Tables

1   List of Contributing Members

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

2   Abstract

This document contains the Business Requirements and Use Cases for Product Offering Availability and Pricing Discovery between a Seller and a Buyer at the Sonata and Cantata Interface Reference Points. Product Offering Availability Discovery is a way for the Buyer to specify a Product Specification and Delivery Context to the Seller in order to receive from the Seller a list of zero or more Product Offering Configurations. Pricing Discovery allows the Buyer to receive from the Seller a list of one or more Terms and Pricing information for the Product Offering Configuration and Delivery Context specified by the Buyer.

3   Release Notes

This document is still a work in progress. There are several areas that need to be updated within this document based on comments that were received during the last CfCB. These are shown in the table below.

Release Note Topic	Section(s) Impacted	Comments
Update the document to reflect updates in MEF W150 replacing Place with Installation Place.	4, 12.2	This document will be updated as MEF W150 comments from CfC 2 are resolved.
The current timelines for publication between MEF 110 and MEF 150 do not align.		At a minimum MEF 150 must have an approved Draft Standard before MEF 110 can go to letter ballot.
Moving Tables 5 and 6 to align them with the common Types	10.3	Further discussion is required on aligning these tables and where they should be placed.
Revising requirements in section 11 to align with similar requirements in section 10	11	
Combine requirements R42, R43, R44, R48, and R49 into a single requirement.	11.3	

Table 1 – Release Notes

4   Terminology and Abbreviations

This section defines the terms used in this document. 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.

In addition, terms defined in MEF 55.1 [3], MEF W55.1.1 [4], and MEF W79.1 [6] are included in this document by reference and are not repeated in the table below.

Term	Definition	Reference
Business Day	Any day agreed upon by the Buyer and the Seller in which business is normally conducted.	This document
Business Hour	Any hour agreed upon by the Buyer and by the Seller during a Business Day in which business is normally conducted.	This document
Term and Price Option	An option for price and term available to a Buyer for a Product Configuration with a specific Delivery Context.	This document
Delivery Context	A set of related Products and Places that are associated with a Product Specification. These are defined in each of the Product Specification standards (MEF 106, MEF 125, etc.)	This document
Place	A fixed place at which a Product can be installed. Its place can be described either with Geographic Point or by association with an Address.	This document
Pricing Discovery	A method that allows the Buyer to retrieve a list of Terms and Pricing Options from the Seller using a Product Offering Configuration and Delivery Context.	This document
Product Offering Availability Discovery	A method that allows the Buyer to retrieve a list of Product Offering Configurations from the Seller using a Product Specification and Delivery Context.	This document
Synchronous Communication	Communication pattern where the Buyer sends a request and the Seller sends a response containing the necessary information, without the need for any notifications.	This document

Table 2 – Terminology and Abbreviations

5 Compliance Levels

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this document are to be interpreted as described in BCP 14 (RFC 2119 [1], RFC 8174 [2]) 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.

6 Numerical Prefix Conventions

Editor Note 1: This section will be deleted if no numerical prefixes are used in the document.

This document uses the prefix notation to indicate multiplier values as shown in Table 3.

Decimal		Binary	
Symbol	Value	Symbol	Value
k	10^3	Ki	2^{10}
M	10^6	Mi	2^{20}
G	10^9	Gi	2^{30}
T	10^{12}	Ti	2^{40}
P	10^{15}	Pi	2^{50}
E	10^{18}	Ei	2^{60}
Z	10^{21}	Zi	2^{70}
Y	10^{24}	Yi	2^{80}

Table 3 – Numerical Prefix Conventions

7   Introduction

The Product Offering Availability Discovery and Pricing Discovery Model is a method for Buyers and Sellers to conduct business.

Buyers can retrieve a Synchronously Communicated list of available Product Offering Configurations matching their provided criteria, specified as a Delivery Context, using Product Offering Availability Discovery.

Buyers can retrieve a Synchronously Communicated list of available prices and terms for a given Product Offering Configuration and Delivery Context using Pricing Discovery.

This document describes functionality for both the Cantata and Sonata Interface Reference Points, and thus the interaction is either an End Customer purchasing from a Service Provider, or a Service Provider purchasing from a Partner.

This specification defines Business Requirements and Use Cases covering the Cantata and Sonata Interface Reference Points (IRPs).

The remaining sections of the document describe and define the following?

- Availability and Discovery Prerequisites

- Use Cases for Product Offering Availability and Pricing Discovery

- Detailed requirements for Product Offering Availability

- Detailed requirements for Pricing Delivery

- Common attributes shared by both Product Offering Availability and Pricing Delivery

- References

7.1   Product and Pricing Discovery Limitations

Product Offering Availability Discovery and Pricing Discovery are intended for use by a Buyer who has already determined that they will use a particular Seller for services at a particular location/UNI and are only wanting to know exactly what products are available there, and what pricing structures are available for those products. Product Offering Availability Discovery and Pricing Discovery are not intended to be used to determine whether the Seller can provide services/products meeting the Buyers needs at that location/UNI in the first place (i.e. the assumption is that they can), or to compare offerings between different Sellers - since it is not possible to retrieve complete information about, for example, the total cost of a set of related products before ordering some of them. The Product Quote mechanism defined in MEF 80[7] is more appropriate for that type of use.

If the Delivery Context for a particular Product Specification includes relationships to other Products, those other Products must have already been purchased by the Buyer and exist in the Seller's inventory before Product Offering Availability Discovery can be performed for that Product Specification.

8   Availability and Pricing Discovery Prerequisites

As with any other interaction between a Buyer and Seller, a number of pre-requisites must be fulfilled before any of the Use Cases pertaining to Product Offering Availability Discovery and Pricing Discovery can be initiated. Fulfillment of the pre-requisites is done during on-boarding and includes, but is not limited to the following:

- Any elements of the Buyer that are opaque to End Customers, such as ENNIs are in place and are available for use.

- The period of time after which auto-renewal occurs and in which the Buyer can disconnect the Product without penalty is agreed to by the Buyer and Seller.

- The pricing framework has been agreed to by the Buyer and Seller.

- If Business Hours and Business Days are used as values for the Units attribute, the Buyer and Seller must agree to their definition as part of on-boarding prior to the use of these values.

- The ability to reuse a Product Offering Configuration Identifier for different Delivery Contexts is agreed to by the Buyer and Seller.

- The Product Specific Attributes that are returned in the Seller's response to a Product Offering Availability Discovery request are agreed to as a part of on-boarding for each Product Specification supported by the Seller.

- The Product Specific Attributes that are returned by the Seller could be different when the Action is INSTALL versus CHANGE.

Details of how on-boarding happens, and the agreements and data exchange that happens through the on-boarding process, are outside the scope of this document.

Delivery Context is defined as set of related Product and Places that are associated with a Product Specification. These are defined in each of the Product Specification Standards (MEF 106 [8], MEF 125 [9], etc.).   For example, the Delivery Context of a UNI would be its physical Place, whereas the Delivery Context for an Access E-Line would be the UNI and ENNI that it connects. A more detailed exploration of the different Delivery Contexts is outside the scope of this document due to the goal of making the Use Cases and requirements independent of the Products they are applied to. The MEF Product Specifications standards define this through their Place and Product Relationship requirements.

9 Use Cases

This section defines the Use Cases for Product Offering Availability Discovery and Pricing Discovery Interfaces between a Buyer and Seller. These interactions are similar to Product Offering Qualification (as specified in MEF W79.1 [6]) and Quoting (as specified in MEF 80 [7]) between a Buyer and a Seller.

Note: The response to the Retrieve Product Offering Availability and Retrieve Pricing for a Product Offering Configuration request differs from a Quote response in that it returns all possible terms and pricing for the Product Offering Configuration where the Quote only returns a single term and price.

The Use Cases are listed with their descriptions in Table 4.

Use Case #	Use Case Name	Use Case Description
1	Retrieve Product Offering Availability	The Buyer requests a list of available Product Offering Configurations from the Seller for a specific Product Specification within the specified Delivery Context. The Seller responds to the Buyer with a list of Product Offering Configurations meeting the Buyer's criteria and the Installation Interval for each of these. Each Product Offering Configuration has a unique identifier that is passed to the Buyer by the Seller. This identifier is used for Retrieve Pricing and Terms use case .
2	Retrieve Pricing and Terms	The Buyer requests a list of Pricing and Terms from the Seller for a specific Product Offering Configuration Identifier within a specific Delivery Context. The Seller responds to the Buyer with a list of Pricing and Terms for the specified Product Offering Configuration.

Table 4 – Use Case Table

Note: Address Validation is outside the scope of this document and may be required to be supported as a part of the Pre-Order process by a separate API.

9.1 Use Case One vs Create POQ with Product Offering(MEF W79.1) Differences

The use-cases described in this document are functionally similar to the use-cases defined in MEF W79.1 [6], but there are some key differences. MEF W79.1 specifies the process used for Product Offering Qualification. These differences are explained in this section.

Retrieve Product Offering Availability use case differs from the Create POQ with Product Offering Use Case because this use case only supports the Buyer specifying a Product Specification while MEF W79.1 [6] allows the Buyer to specify both the Product Specification and a specific Product Offering. Retrieve Product Offering Availability for an INSTALL differs from the Create POQ with Product Offering Use Case for an INSTALL in MEF 79.1 [6] because MEF 79.1 [6] requires the Buyer to specify a Product Offering with required Product Specific Attribute values. In a POQ, the Seller returns results for only that Product Specific Attribute values.

In the Product Offering Availability Discovery, the Buyer specifies a Product Specification, and a Delivery Context. The Seller returns a list of Product Offering Configurations that meet the Product Specification and Delivery Context provided by the Buyer. Where this is accomplished using a single request/response within this Use Case, this would take multiple MEF 79.1 [6] Create POQ with Product Offering requests (one per desired Product Offering Configuration) to verify that the requested Product Offering Configuration is available within the Delivery Context and what the installation interval is expected to be.

These differences are shown in the following figures:
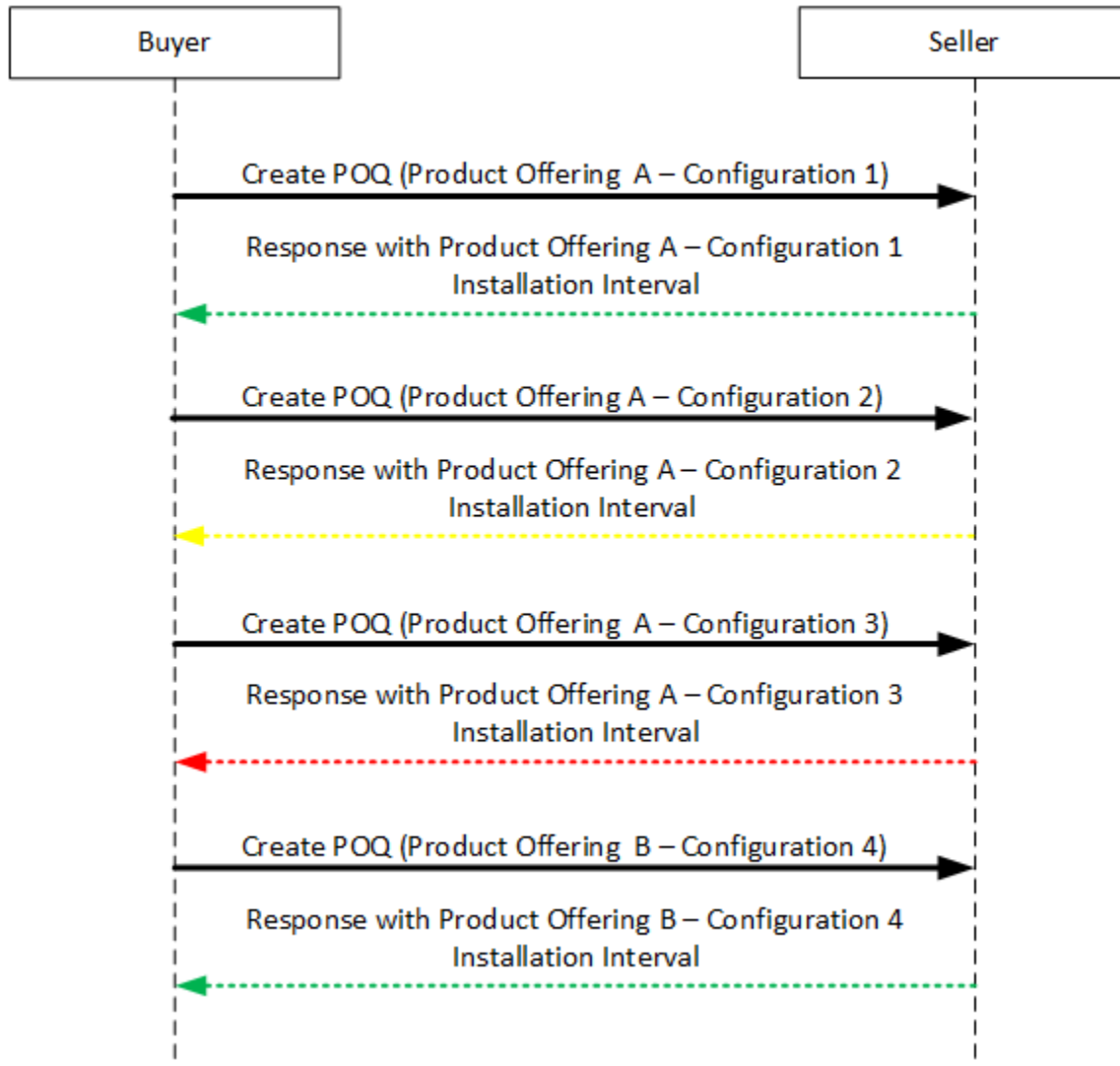
Figure 1 –POQ Process Example

Product Offering A and Product Offering B are based on the same Product Specification.
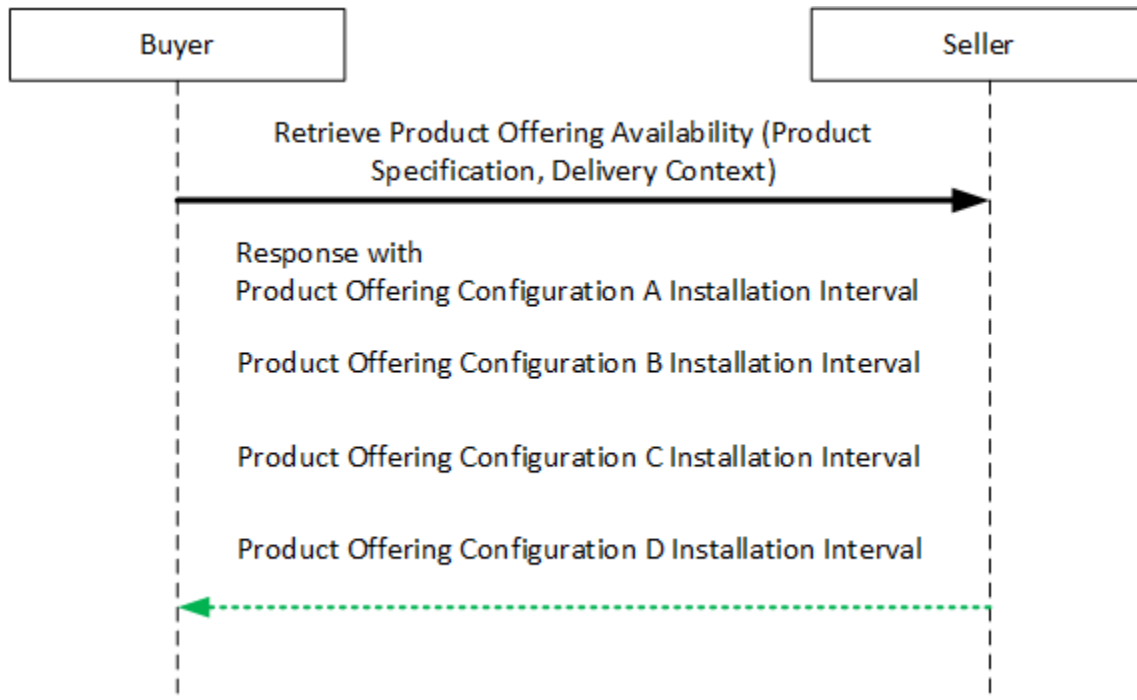
Figure 2 – Retrieve Product Offering Availability Example

As an example, a Buyer submits a request for Product Offering Availability Discovery for a Product Specification of a UNI for a specific Delivery Context. The Seller returns a list of UNI Product Offering Configurations that are supported at the specific Delivery Context. Note that this list may be a subset of what is offered in the Product Catalog since it is restricted to the Product Offering Configurations that are available in the Delivery Context. A Product Catalog lists and describes all of the Product Offerings made available by a Seller to potential Buyers. If the Seller sells a 100 Gbps UNI Product Offering but the Delivery Context cannot support a UNI with a speed greater than 10 Gbps, only the Product Offering Configurations up to 10 Gbps UNI speeds are returned.

If the Action is CHANGE, MEF W79.1 [6] defines that the Product Identifier with required Product Specific Attribute values are combined in the request. The Seller responds with a result indicating the confidence and lead time to deliver the change to the configuration specified. When the CHANGE Action is used for a Product Offering Availability request, only the Product Identifier of the Installed Product is supplied in the request from the Buyer to the Seller. A list of Product Offering Configurations that the installed Product can be changed to are provided in the response from the Seller to the Buyer. Any Product Offering Configurations that the installed Product cannot be changed to are not returned in the response from the Seller to the Buyer.

The Action DISCONNECT is not supported for Retrieve Product Offering Availability.

9.2   Use Case Two vs Create Quote (MEF 80) Differences

The use-cases described in this document are functionally similar to the use-cases defined in MEF 80 [8], but there are some key differences. These differences are explained in this section.

Retrieve Pricing and Terms use case differs from the Create Quote Use Case in MEF 80 [7] because it returns all possible Terms and Pricing for a Product Offering Configuration with Buyer specified Delivery Context via a single request and response instead of the terms and pricing for the specific configuration and requested term provided in the Create Quote Use Case in MEF 80 [7]. With the Create Quote Use Case in MEF 80 [7], any Buyer that wanted to understand all of the term and pricing options would have to send a separate Create Quote request to the Seller for each term offered by the Seller assuming that the Buyer even knew what terms the Seller offered to find the pricing for that particular term.

Note: Retrieve Pricing and Terms input differs if the Action is INSTALL or CHANGE. Further details on this are shown in section 11.
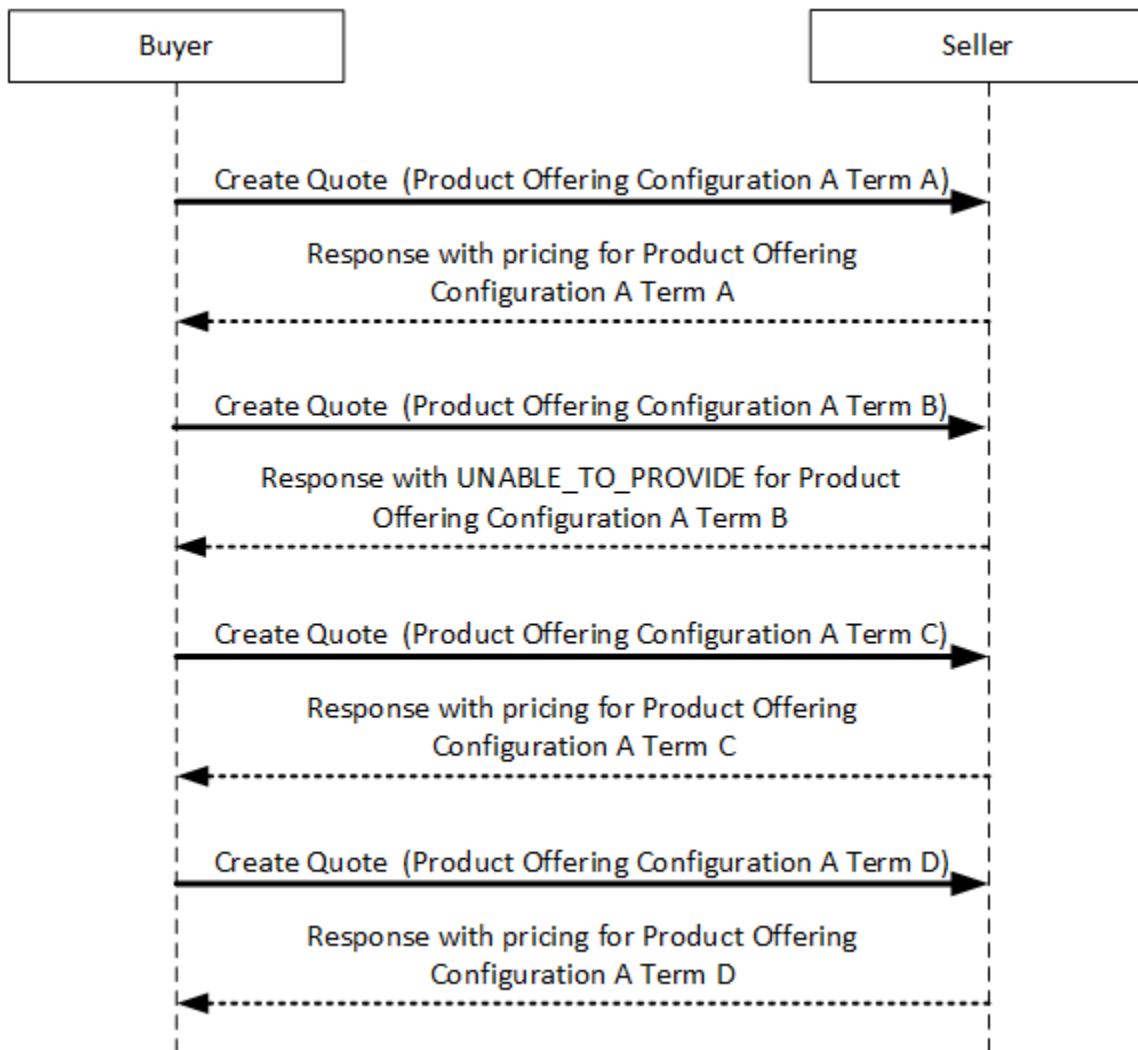
Figure 3 – Create Quote Example

As an example, in Figure 4, a Buyer submits a request for Pricing Discovery for a 10 Gbps UNI Product Offering Configuration in a specific Delivery Context. The Seller returns all terms and pricing for the UNI that is offered to the Buyer. In this example, there are four possible terms,

each with corresponding pricing that is returned. The Buyer can then select their desired term when they place the Product Order.
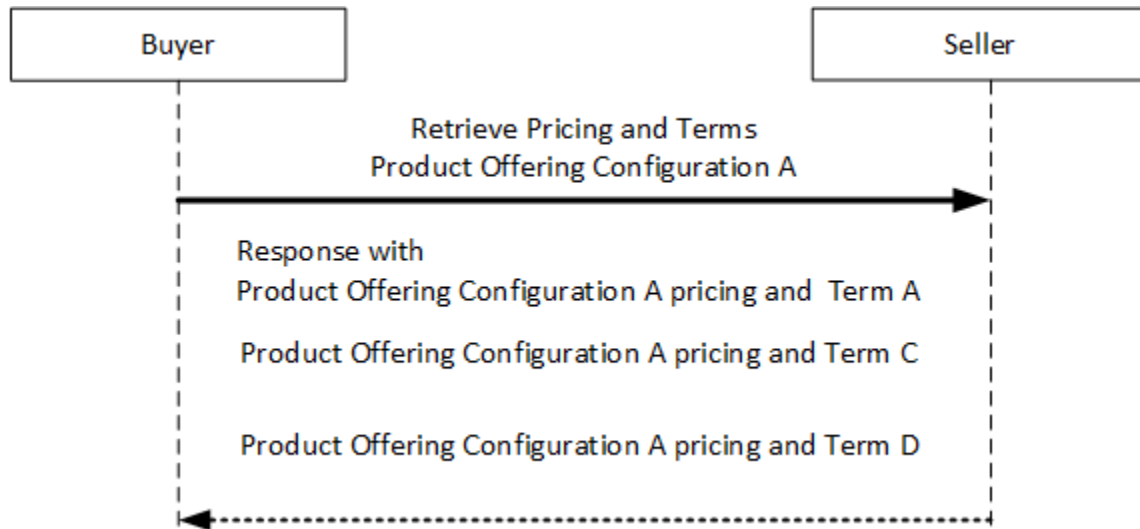
Figure 4 – Retrieve Pricing and Terms Example

10 Retrieve Product Offering Availability Discovery (Use Case 1)

Retrieve Product Offering Availability use case is defined within this section.

In this Use Case, the Buyer requests a list of available Product Offering Configurations from the Seller for a specific Product Specification or Product within a specified Delivery Context. The Seller Synchronously Communicates to the Buyer a list of zero or more Product Offering Configurations meeting the Buyer's criteria (Product Specification Identifier for Action = INSTALL, Product Identifier for Action = CHANGE) and the Installation Interval for each Product Offering Configuration.

Retrieve Product Offering Availability use case covers the Actions, INSTALL and CHANGE. An INSTALL action is used by the Buyer to express the intention of installing a new Product based on the given Product Specification and Delivery Context, and to receive the list of possible Product Offering Configurations.

A CHANGE action is used to identify, based on a Product Identifier, if there are Product Specific Attributes that can be changed and to what values they can be changed.

> **[R1]** The Buyer **MUST** support Retrieve Product Offering Availability use case .

> **[R2]** The Seller **MUST** support Retrieve Product Offering Availability use case .

Note: the DISCONNECT Action has not been included in this document for the Retrieve Product Offering Availability use case since there are no Product Specific Attributes that can be changed with a DISCONNECT Action within a Product Order.

10.1 Actors

The Actors of Retrieve Product Offering Availability use case are the Buyer and the Seller.

10.2 Pre-Conditions

The Pre-Conditions for Retrieve Product Offering Availability use case are defined below:

1. Any referenced pre-requisite Products are in place and are in the correct Administrative or Operational state to be referenced.

2. Any referenced Installation Place identifiers exist within the Seller's systems and are available to the Buyer.

Note: Installation Place is defined in MEF W150 [10].

10.3 Retrieve Product Offering Availability use case Process Steps

The process steps and requirements for Retrieve Product Offering Availability use case are defined below:

1. The Buyer places a Retrieve Product Offering Availability request for an Action of INSTALL, or the Buyer places a request to retrieve Product Offering Availability Discovery for an Action of CHANGE.

Note: For the context of this document, CHANGE indicates that the Buyer is requesting a change to the Product Specific Attribute values of an existing Product identified by its Product Identifier. In case of Action CHANGE, a list of available Product Offering Configurations is returned based on the Product Offering the installed Product is based on. This list may be the same as what was returned for INSTALL or it may be a sub-set of what was returned for INSTALL based on business rules. The Delivery context cannot be changed with a Retrieve Product Offering Availability.

Attribute	Description	Type
Action	The action to be performed by the Seller to fulfil any Order that results from this interaction.	Indicator with the following allowed values: • INSTALL • CHANGE
Product Specification Identifier	A reference to a Product Specification that may come from the Seller's Product Catalog or be exchanged between the Buyer and Seller during on-boarding. This is used when the Action = INSTALL.	Identifier
Product Identifier	A reference to a Product in the Product Inventory that is used when the Action = CHANGE	Identifier
Product Relationships	A list of Products with their relationship types defined by the Product Specification identified by the Product Specification Identifier attribute.	List of Product Relationships (see Table 12)
Places	A list of Places and their roles defined by the Product Specification identified by the Product Specification attributes. Only specified for Action = INSTALL.	List of Places (see Table 6)

Table 5 – Retrieve Product Offering Availability use case Request Attributes

Attribute	Description	Type	Comments
Role	The role of the place as specified in the Product Specification	String	Set by the Buyer as defined in the Product Specification
Place Type	The attribute used to describe the Place formatting at which the new Product is intended to be installed by the Buyer.	String that is one of: • SERVICE_SITE • INSTALLATION_PLACE	The Buyer is encouraged to use the Seller's SERVICE_SITE as the Place Type if one exists.
Place Description	The detailed Place at which this Product is installed or is to be installed if this Product is to be installed at a particular Place.	Reference to one of the below: • Service Site (see MEF W150 [10]) • Installation Place Identifier (see MEF W150 [10])	

Table 6 – Place Relationship Attributes

[R3]   When the desire of the buyer is to install a new product, the Retrieve Product Offering Availability request (Retrieve Product Offering Availability use case) **MUST** contain the following attributes defined in Table 5:

- Action with its' value set to INSTALL

- Product Specification Identifier

[R4]   When the desire of the buyer is to change an existing product, the Retrieve Product Offering Availability request **MUST** contain the following attributes defined in Table 5:

- Action with its' value set to CHANGE

- Product Identifier

[R5]   When the desire of the buyer is to install a new product if the Product Specification specifies mandatory Places, the Retrieve Product Offering Availability request **MUST** contain the following attributes defined in Table 5:

- Places

[R6]   Every Place in the request submitted by the Buyer **MUST** specify the following attributes:

- Place

- Role

[R7]   A Place **MUST NOT** include any attributes that are not defined in Table 6.

[R8]   When the desire of the buyer is to install a new product if the Product Specification specifies mandatory Product Relationships, the Retrieve Product Offering Availability request **MUST** contain the following attributes defined in Table 5:

- Product Relationships

Note: There may be cases where a Buyer cannot precisely state which installed Product a newly installed Product will be related to because the Buyer will determine this at the time of submitting the Product Order. The Buyer can include a list of candidate installed Products to be validated against. An example is the ENNI for an Access E-Line Service where the Buyer may, for example, include a list of ENNIs between the Buyer and Seller as related Products. The Products in the list would be expected to comply with a business rule agreed to by the Buyer and Seller (e.g. ENNIs that are all live and all in the same Geographic Area as defined by the Seller). When this happens, it is at the Seller's discretion to choose the item on the list which is used to fulfil the request.

[R9]   If the desire of the buyer is to install a new product, the Retrieve Product Offering Availability request submitted by the Buyer to the Seller for Retrieve Product Offering Availability use case **MUST NOT** include the Product Identifier attribute.

[R10]   If the desire of the buyer is to install a new product and if Product Relationships are provided, the request submitted by the Buyer to the Seller for Retrieve Product Offering Availability use case **MUST** only include Product Relationships as defined by and in accordance with the rules given in the Product Specification referenced in the Product Specification Identifier attribute.

[R11]   If the desire of the buyer is to install a new product and if the Place(s) are provided, the list submitted by the Buyer to the Seller for Retrieve Product Offering Availability use case **MUST** only include a Place and Place Type for every Place Role defined by and in accordance with the rules given in the Product Specification referenced in the Product Specification Identifier attribute.

[R12]   If the desire of the buyer is to change an existing product, the Retrieve Product Offering Availability request **MUST NOT** contain the following attributes defined in Table 5:

- Product Specification Identifier

- Product Relationships

- Places

[R13]   The request submitted by the Buyer to the Seller for Retrieve Product Offering Availability use case **MUST NOT** include any attributes that are not defined in Table 5.

2. The Seller validates the request to ensure that:

    a. If the Action attribute is set to INSTALL

        i. The Product Specification Identifier is present and valid.

        ii. The Places have been provided in accordance with the referenced Product Specification

        iii. The correct Product Relationships have been provided in accordance with the referenced Product Specification

        iv. There is compliance to other additional criteria and constraints that apply to the request agreed by the Buyer and Seller during on-boarding

    b. If the Action attribute is set to CHANGE

        i. The Product Identifier is present and valid.

        ii. No Places have been provided

        iii. No Product Relationships have been provided

There is compliance to other additional criteria and constraints that apply to the request agreed by the Buyer and Seller during on-boarding.

3. The Seller Synchronously Communicates to the Buyer a list of zero or more Product Offering Configurations, including the Installation Interval for each:

Note: the use of a Product Offering Configuration Identifier within a Product Order is beyond the scope of this document.

[R14]   The Seller **MUST** echo back the attributes of the Retrieve Product Offering Availability request.

Attribute	Description	Type
Product Offering Configuration Identifier	The identifier for a Product Offering Configuration.	Identifier
Product Offering Identifier	The identifier of the Product Offer for which this Product Offering Configuration is valid.	Identifier
Product Specific Attributes	The set of technical attributes for the Product Offering that make this configuration unique. This essentially specifies the values for attributes defined in the Product Offering.	For each Product Specification the Product Specific Attributes that are included in the response are agreed to by the Buyer and Seller during on-boarding. Included Product Attributes could differ based on the Action in the request of the Buyer.
Installation Interval	The indicative duration ≥0 for the delivery of the Product Offering Configuration in the specified Delivery Context . The shortest possible Installation Interval is specified by the Seller. It is not considered a commitment by the Seller.	Duration (see section 12.3)

Table 7 – Product Offering Configuration Attributes

[R15] The Seller **MUST NOT** return a response to a Retrieve Product Offering Availability request that contains two Installation Intervals and where all Product Specific Attributes are the same.

[R16] If the desire of the buyer is to install a new product and the request is successful, the response given by the Seller to the Buyer for Retrieve Product Offering Availability use case **MUST** include a list of zero or more Product Offering Configurations with the attributes shown in Table 7.

[R17] If the request is unsuccessful or fails validation, the response given by the Seller to the Buyer for Retrieve Product Offering Availability **MUST NOT** contain any Product Offering Configurations

[R18] If the request is unsuccessful or fails validation, the response given by the Seller to the Buyer for Use Case 1 **MUST** indicate that an error occurred.

[R19] If the request is successful and contains a non-empty list, every Product Offering Configuration in the response given by the Seller to the Buyer in Retrieve Product Offering Availability use case **MUST** include a Product Offering Configuration Identifier attribute that uniquely identifies that Product Offering Configuration within the Seller.

[R20]   If the request is successful and contains a non-empty list, every Product Offering Configuration in the response given by the Seller to the Buyer **MUST** include a Product Offering Identifier for a Product Offering that can be delivered as shown in Table 7.

[R21]   For any Product Specification used in a Product Offering Availability request, the Seller **MUST** only include the set of Product Specific Attributes agreed to by the Buyer and by the Seller during on-boarding.

[R22]   If the request is successful and contains a non-empty list, every Product Offering Configuration in the response given by the Seller to the Buyer **MUST** include values for the agreed set of Product Specific Attributes according to the Product Specification.

[R23]   If the request is successful, and contains a non-empty list, every Product Specific Attribute in the response given by the Seller to the Buyer **MUST NOT** include any Product Specific Attributes that are not agreed to set in the Product Specification.

[R24]   If the request is successful and contains a non-empty list, every Product Offering Configuration in the response given by the Seller to the Buyer **MUST** include the Installation Interval attribute.

[R25]   If the request is successful and contains a non-empty list, every Product Offering Configuration in the response given by the Seller to the Buyer **MUST NOT** include any attributes that are not defined in Table 7 and an echo back of the Buyer provided attributes in the request.

[R26]   For each Product Offering Configuration, its Product Offering Configuration Identifier **MUST** be valid for a Retrieve Pricing and Terms request for a period of at least 15 minutes.

The use of a Product Offering Configuration Identifier within other business functions (e.g. Product Order) is beyond the scope of this document.

10.4 Post Conditions

The Post Conditions of this Use Case are that the Buyer knows the different Product Offering Configurations available within the Delivery Context. In addition, the Buyer has an indication of the Installation Interval for each of the Product Offering Configurations.

10.5 Alternative Paths

The Alternative Paths for this Use Case are the Seller returns an error message if:
  1. The request is missing mandatory or conditionally mandatory (where applicable) parameters.
  2. Pre-agreed constraints and business rules have not been complied with.

11 Retrieve Pricing and Terms (Use Case 2)

The Buyer can request a list of Pricing and Terms and their relationship from the Seller for a specific Product Offering Configuration selected from the list of Product Offering Configurations returned by the Seller. The Seller responds using Synchronous Communication to the Buyer with a list of one or more Pricing and Terms for the specified Product Offering Configuration.

Retrieve Pricing and Terms use case covers the two Actions, INSTALL, and CHANGE. They share the same Actors and Pre-Conditions.

> **[R27]** The Buyer **MUST** support Retrieve Pricing and Terms use case .

> **[R28]** The Seller **MUST** support Retrieve Pricing and Terms use case .

11.1 Actors

The Actors of Retrieve Pricing and Terms use case are the Buyer and the Seller.

11.2 Pre-Conditions

The Pre-Conditions for Use Cases 2 are:

1. Buyer has a reference to a Product Offering Configuration and the linked Product Offering Configuration Identifier.

2. Any referenced pre-requisite Products are in place and are in the correct Administrative or Operational state to be referenced.

3. Any referenced Place identifiers exist within the Seller's systems and are available to the Buyer.

4. The period for which the Product Offering Configuration Retrieve Pricing and Terms response is valid is agreed to by the Buyer and Seller.

11.3 Retrieve Pricing and Terms use case Process Steps

1. The Buyer sends a request to Retrieve Pricing and Terms for a Product Offering Configuration.

Attribute	Description	Type
Action	The action to be performed by the Seller to fulfill any Order that results from this interaction.	Indicator with the following allowed values: • INSTALL • CHANGE
Product Offering Configuration Identifier	The identifier for the Product Offering Configuration from a Retrieve Product Offering Availability use case response that Pricing and Terms are being requested for.	Identifier
Product Identifier	A reference to a Product in the Product Inventory	Identifier
Product Relationships	A list of Products with their relationship types defined as mandatory by the Product Offering identified by the Product Specification Identifier attribute.	List of Product Relationships (see Table 12)
Places	A list of Places and their roles defined as mandatory by the Product Specification identified by the Product Offering Configuration Identifier attribute.	List of Places (see Table 6)

Table 8 – Retrieve Pricing and Terms use case Request Attributes

[R29]   When the Buyer is interested in a new Product, the Retrieve Pricing and Terms for a Product Offering Configuration request (Retrieve Pricing and Terms use case) **MUST** contain the following attributes defined in Table 8:

- Action of INSTALL

- Product Offering Configuration Identifier

- Product Relationships (if defined in the Product Specification)

- Places (if specified in the Product Specification)

[R30]   The request submitted by the Buyer to the Seller when the desire of the buyer is to install a new product **MUST NOT** include the Product Identifier attribute.

[R31]   When the desire of the buyer is to change an existing product, the Retrieve Pricing and Terms for a Product Offering Configuration request **MUST** contain the following attributes defined in Table 8:

- Product Offering Configuration Identifier

- Product Identifier

[R32]   When provided, the list given in the attribute Product Relationships in the request submitted by the Buyer to the Seller for Retrieve Pricing and Terms use case **MUST** include all Product Relationships and relationship types as defined by and in accordance with the rules given in the Product Specification for the Product Offering Configuration referenced in the Product Offering Configuration Identifier attribute.

[R33]   When provided, the list given in the attribute Product Relationships in the request submitted by the Buyer to the Seller for Retrieve Pricing and Terms use case **MUST NOT** include any Product Relationship having a Product Relationship Nature that are not defined by the Product Specification for the Product Offering Configuration referenced in the Product Offering Configuration Identifier attribute.

[R34]   When provided, the list given in the attribute Places in the request submitted by the Buyer to the Seller for Retrieve Pricing and Terms use case **MUST** include Places with roles defined by and in accordance with the rules given in the Product Specification for the Product Offering Configuration referenced in the Product Offering Configuration Identifier attribute.

[R35]   When provided, the list given in the attribute Places in the request submitted by the Buyer to the Seller for Retrieve Pricing and Terms use case **MUST NOT** include any Places with roles that are not defined by the Product Specification for the Product Offering Configuration referenced in the Product Offering Configuration Identifier attribute.

[R36]   The request submitted by the Buyer to the Seller for Retrieve Pricing and Terms use case **MUST NOT** include any attributes that are not defined in Table 8.

2. The Seller validates the request to ensure:

   a. The Product Offering Configuration Identifier is valid in the case where the Buyer is interested in a new Product. The Product Identifier is valid in a case where the Buyer is interested in changing an existing Product.

[R37]   If the Product Offering Configuration Identifier has expired, the Seller **MUST** return an error.

   b. The correct number of Places are provided, each with an appropriate role meeting the criteria of the Product Specification when the Buyer is interested in a new Product.

   c. Where relationships to other Products are required by the Product Specification, they refer to valid Products of the correct Product Specification and each with the correct Relationship Nature according to the Product Specification definition when the Buyer is interested in a new Product.

d. There is compliance to any additional criteria and constraints that apply to the request agreed between the Buyer and Seller during on-boarding.

3. The Seller responds to the Buyer with a list of zero or more Pricing and Terms for the specified Product Offering Configuration with Delivery Context.

[R38] If the request is successful, the response given by the Seller to the Buyer for Retrieve Pricing and Terms use case **MUST** include the attribute Product Offering Configuration Pricing and Terms.

[R39] If the request is successful, the response given by the Seller to the Buyer for Retrieve Pricing and Terms use case **MUST NOT** include any attributes that are not defined in Table 9 and Table 10.

[R40] If a Seller has returned multiple Product Offering Configuration IDs to the Buyer in different Product Offering Availability Discovery responses that refer to the same set of Product Specific Attribute values, then the Seller **MUST** return the same Pricing and Terms to a Retrieve Pricing and Terms request for a given Delivery Context that contains any of those POC IDs that are within their validity period.

[R40] means that a Retrieve Pricing and Terms request for a given Delivery Context and a given set of Product Specific Attribute values always returns the same result regardless of which Product Offering Configuration ID is used to refer to that Product Offering Configuration. In particular, this is the case even if the POC ID was originally returned to the Buyer in an Availability Discovery response for a different Delivery Context.

As an example, a Buyer who completes three different Retrieve Product Offering Availability Discoveries for a UNI for Delivery Contexts A, B, and C. The Buyer receives three Product Offering Configurations, UNIs with Identifiers 1 (Delivery Context A), 5 (Delivery Context B), and 9 (Delivery Context C) that have identical Product Specific Attribute values including Installation Interval. If the Buyer performs a Retrieve Pricing and Terms request for Delivery Context B the Pricing and Terms must be the same regardless of whether the Buyer uses Product Offering Configuration Identifier 1, 5, or 9 since they all refer to the same set of values.

[R41] All attributes included in the Buyer's request **MUST** be echoed back to the Buyer in the Seller's response.

Attribute	Description	Type
Product Offering Configuration Pricing and Terms	A set of contract terms and corresponding prices available for a given Product Offering Configuration considering the Delivery Context.	A list of Product Offering Configuration Pricing and Terms (Table 10)

Table 9 – Product Offering Configuration Commercial and Contractual Option Attribute

Attributes in Table 10 are included for each Term and Price.

Attribute	Description	Type
Product Offering Configuration Pricing and Term Identifier	The identifier for a Product Offering Configuration Commercial and Contractual Option for the given Product Offering Configuration.	Identifier
Installation Interval	The indicative duration ≥0 for the delivery of the Product Offering Configuration in the specified Delivery Context . The shortest possible Installation Interval is specified by the Seller. It is not considered a commitment by the Seller.	Duration (see section 12.3)
Term	The minimum length of the commitment for this Product Offering Configuration Commercial and Contractual Option for the given Product Offering Configuration Option within the requested Delivery Context.	Duration (see section 12.3)
End of Term Action	The action the Seller will take once the term expires.	Indicator with following allowed values: • ROLL • AUTO_DISCONNECT • AUTO_RENEW These values are defined as shown below.
Roll Interval	The period that the Buyer is required to commit to pay in a recurring fashion at the end of the term.	Duration (see section 12.3)

Attribute	Description	Type
Prices	The prices that apply to this Product Offering Configuration Commercial and Contractual Option for the given Product Offering Configuration within the requested Delivery Context.	List of Price (see section 11.4)
Subject to Additional Non-recurring Charges	An indicator to inform the Buyer that additional non-recurring charges may be added during fulfillment.	Boolean

Table 10 – Product Offering Configuration Commercial and Contractual Option Details

The Seller End of Term Action attribute values are defined as follows:

- "ROLL" if the Product's contract will continue on a rolling basis once the contract's current term expires,

- "AUTO_DISCONNECT" if the Product will automatically be disconnected (and contract terminated) by the Seller once the contract term expires,

- "AUTO_RENEW" if the Product's contract will be renewed for another term equivalent to the original contract term.

Note: it is normal for the Roll Interval to be a significantly shorter time period than the original term.

The period for which the Product Offering Configuration Retrieve Pricing and Terms response is valid is agreed to by the Buyer and Seller.

    [R42]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer in Retrieve Pricing and Terms use case **MUST** include a Product Offering Configuration Commercial and Contractual Option Identifier attribute.

    [R43]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST** include a Term attribute representing the minimum commitment term that the Buyer would be committing to if this Contractual Option is ordered.

    [R44]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST** include the Seller End of Term Action attribute.

    [R45]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST**

include the Roll Interval attribute if the End of Term Action attribute is "ROLL".

[R46]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST NOT** include the Roll Interval attribute if the End of Term Action attribute is "AUTO-RENEW" or "AUTO-DISCONNECT".

[R47]   If the request is successful, the {ricing and Terms in the response given by the Seller to the Buyer **MUST** be valid for at least 15 minutes.

[R48]   If the request is successful, every Product Offering Configuration Pricing and Term Option in the response given by the Seller to the Buyer **MUST** include a Prices attribute.

[R49]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST** include a Subject to Additional Non-recurring Charges attribute.

Note: The Subject to Additional Non-recurring Charges attribute is used to indicate additional construction costs or other one-time costs that are not known may be added during fulfillment. This is managed through the Charge Process in the Product Order Process.

[R50]   If the request is successful, the Subject to Additional Non-recurring Charges attribute in each Product Offering Configuration Commercial and Contractual Option in the response **MUST** be FALSE if the referenced Product Offering Configuration Option has its' Installation Interval <1.

[R51]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST NOT** include any attributes that are not defined in Table 10 other than the attributes from the Buyer's request that are echoed back.

[R52]   If the request is successful, the Product Offering Configuration Commercial and Contractual Option Identifier **MUST** be unique within the Seller's system.

[R53]   If the request is successful, every Product Offering Configuration Commercial and Contractual Option in the response given by the Seller to the Buyer **MUST** include a Subject to Additional Non-recurring Charges attribute.

Note: The Subject to Additional Non-recurring Charge attribute is similar but not exactly like the Firm and Firm Subject to Feasibility Study in MEF 80. If the Subject to Additional Non-recurring Charge attribute value is FALSE, then this is equivalent to the Firm value in MEF 80. If the Subject to Additional Non-recurring Charge attribute value of the flag is TRUE, then this is equivalent to the Firm Subject to Feasibility Study value in MEF 80.

11.4 Price Attributes

The Price attributes and associated requirements are defined in MEF 80 [7] section 8.1.6.

11.5 Post Conditions

The Buyer receives a list of one or more Pricing and Terms meeting the Buyer's criteria.

11.6 Alternative Paths

The Seller returns an error message if:

1. The request is missing mandatory or conditionally mandatory (where applicable) attributes.

2. The supplied Product Offering Configuration Identifier is invalid.

3. The Delivery Context has not been fully specified when the Buyer is interested in a new Product.

4. Pre-agreed constraints and business rules have not been complied with.

12 Common Types

This subsection describes common types that are used by requests made from the Buyer to the Seller in both Retrieve Product Offering Availability use case and Retrieve Pricing and Terms use case .

12.1 Product Relationship Attributes

The Product Relationship attributes and requirements from Table 12 and Table 8 are defined in MEF 80 [7] section 8.1.8.

12.2 Place Relationship Attributes

[R54] Every Place Relationship in the request submitted by the Buyer to the Seller **MUST** include a Role attribute.

[R55] A Place Relationship **MUST NOT** include any attributes be that are not defined in Table 6.

For details on Place see MEF W150 [10].

12.3 Duration attributes

The attributes of the Duration type are given in Table 11.

Attribute	Description	Type
Amount	The number of units specified by Unit	Integer
Units	The unit of time	String with the following allowed values: - SECONDS - BUSINESS_MINUTES - CALENDAR_MINUTES - CALENDAR_HOURS - BUSINESS_HOURS - CALENDAR_DAYS - BUSINESS_DAYS - CALENDAR_MONTHS - CALENDAR_YEARS

Table 11 – Duration attributes

Note: MEF 80 [7] does not include SECONDS as an allowed value. This has been added to this document.

[R56]   Every Duration in the response given by the Seller to the Buyer **MUST** include an Amount attribute.

[R57]   The value of the Amount attribute in every Duration in the response given by the Seller to the Buyer **MUST** have a value that is equal to or greater than 0.

[R58]   Every Duration in the response by the Seller to the Buyer **MUST** include a Units attribute.

[R59]   The value of the Units attribute **MUST** be one of: SECONDS, BUSINESS_MINUTES, CALENDAR_MINUTES, CALENDAR_HOURS, BUSINESS HOURS, CALENDAR_DAYS, BUSINESS_DAYS, CALENDAR_MONTHS, or CALENDAR_YEARS.

Note: some of the Units attributes apply to only terms, some apply to only installation intervals, and some apply to both of those as agreed to by the Buyer and Seller.

Consecutive Business Days might not be consecutive calendar days. Consecutive Business Hours may have a break between them if they span a period outside of which normal business is conducted.

[R60]   Every Duration in the response given by the Seller to the Buyer **MUST NOT** include any attributes that are not defined in Table 11.

12.4 Product Relationship

Attribute	Description	Type
Related Product Identifier	A list of one or more Identifiers of existing Products (unique within this Seller). When the Buyer provides multiple Related Product Identifiers the Seller processes the list as defined in the Product Specification.	List of Identifier(s)
Relationship Nature	Specifies the nature of relationship to the related Product. The nature of required relationships vary for Products of different types. For example, a UNI or ENNI Product may not have any relationships, but an Access E-Line may have two mandatory relationships (related to the UNI on one end and the ENNI on the other). More complex Products such as multipoint IP or Firewall Products may have more complex relationships. As a result, the allowed and mandatory Relationship Nature values are defined in the Product Specification.	String that is one of the relationship types specified in the Product Specification.

Table 12 – Product Relationship Attributes

[R61] Every Product Relationship in the request submitted by the Buyer **MUST** specify the following attributes:

- Related Product Identifier

- Relationship Nature

13 References

[1]   IETF RFC 2119, *Key words for use in RFCs to Indicate Requirement Levels*, by S. Bradner, March 1997

[2]   IETF RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, by B. Leiba, May 2017, Copyright (c) 2017 IETF Trust and the persons identified as the document authors. All rights reserved.

[3]   MEF 55.1, *Lifecycle Service Orchestration (LSO): Reference Architecture and Framework*, January 2021

[4]   MEF W55.1.1, *Amendment to MEF 55.1: Reference Architecture and Framework – Terminology*, June 2023

[5]   MEF 57.2, *Product Order Management Business Requirements and Use Cases*, June 2022

[6]   MEF W79.1, *Product Offer Qualification Business Requirements and Use Cases*, January 2023

[7]   MEF 80, *Quote Management Requirements and Use Cases*, July 2021

[8]   MEF 106, *LSO Sonata Access E-Line Product Schemas and Developer Guide*, February 2023

[9]   MEF 125, *LSO Cantata and LSO Sonata Subscriber Ethernet Product Schemas and Developer Guide*, February 2023

[10]   MEF W150, *Address and Service Site Management, Business Requirements and Use Cases*

Appendix A