Mplify Standard
Mplify 149

LSO Allegro, LSO Interlude and LSO Legato
Service Function Testing API
Developer Guide

February 2026

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List of Contributing Members

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

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Table 1. Contributing Members

1. Abstract

This standard is intended to assist the implementation of the Application Programming Interfaces (APIs) for the Service Function Testing functionality of the Service Orchestration Function at the LSO Allegro, LSO Interlude and LSO Legato Interface Reference Points (IRPs), for which requirements and use cases are defined in [Mplify 136.1]. The requirements and use cases are the same for all IRPs. This standard consists of this document and complementary API definitions for Service Function Testing Management and Service Function Testing Notifications.

This standard normatively incorporates the following files by reference as if they were part of this document from the GitHub repository:

MEF-LSO-Allegro-SDK

commit id: 0ac5d97e881507a3e9750a2784246d49b7905848

- `serviceApi/sft/serviceFunctionTest.api.yaml`
- `serviceApi/sft/serviceFunctionTestNotification.api.yaml`

MEF-LSO-Interlude-SDK

commit id: 1179c709a465a86987702ba4aa0f7846dcf68e37

- `serviceApi/sft/serviceFunctionTest.api.yaml`
- `serviceApi/sft/serviceFunctionTestNotification.api.yaml`

MEF-LSO-Legato-SDK

commit id: 84a92bb18893bdfdc5b5fe4a8f685f5180e7a9a0

- `serviceApi/sft/serviceFunctionTest.api.yaml`
- `serviceApi/sft/serviceFunctionTestNotification.api.yaml`

The Service Function Testing API is defined using OpenAPI 3.0 [OAS-V3]

2. Terminology and Abbreviations

This section aims to clarify the terminology used throughout this document. In many cases, the authoritative definitions of terms can be found in separate documents. To ensure accuracy and consistency, the third column of this document serves to provide the appropriate references from Mplify or external sources that govern these definitions.

In addition, terms defined in the standards referenced below are included in this document by reference and are not repeated in the table below:

- Mplify 136.1 *Allegro, Interlude and Legato Service Function Testing BR&UC* [Mplify 136.1]
- MEF 55.1 *Lifecycle Service Orchestration (LSO): Reference Architecture and Framework* [MEF 55.1]

Term	Definition	Source
API Endpoint	The endpoint of a communication channel (the complete URL of an API Resource) to which the HTTP-REST requests are addressed to operate on the *API Resource*.	rapidapi.com This document
API Resource	A REST Resource. In REST, the primary data representation is called Resource. In this document, *API Resource* is defined as an OAS *SchemaObject* with specified *API Endpoints*.	restfulapi.net This document
Bundled	Two or more Test Profiles are related together in a bundle and are given an order in which they are run.	Mplify 136.1
Dependency	The related Test Profile is dependent on the success or failure of another Test Profile. As an example if test 1 passes, then test 2 is performed. If test 1 fails, then test 2 is not performed.	Mplify 136.1
Notification	A notification is a representation of an event that is exchanged between interested parties. An event is a significant occurrence or change in system state that is important from the perspective of system administration.	Mplify 136.1
OpenAPI	The OpenAPI 3.0 Specification, formerly known as the Swagger specification is an API description format for REST APIs.	spec.openapis.org
Operation	An interaction between the Server and Client, potentially involving multiple back-and-forth transactions.	This document
REST API	Representational State Transfer. REST provides a set of architectural constraints that, when applied as a whole, emphasizes scalability of component interactions, generality of interfaces, independent deployment of components, and intermediary components to reduce interaction latency, enforce security, and encapsulate legacy systems.	REST API
SchemaObject	The construct that allows the definition of input and output data types. These types can represent object classes, as well as primitives and array specifications.	spec.openapis.org

Term	Definition	Source
Service Function Testing	The verification of the operation or definition of the Service Under Test. Includes Service Activation and testing performed on in-service Services for maintenance purposes.	Mplify 136.1
Service Identifier	The unique identifier for a specific Service.	Mplify 136.1
Service Specification	The specification of a set of attributes that define a Service type.	Mplify 136.1
Test Job	A definition of SFT for a specific Service Identifier.	Mplify 136.1
Test Profile	Detailed specification that includes the Test Job attributes and Service Specifications that are specified to be tested by this Test Profile.	Mplify 136.1

Table 2. Terminology

Term	Definition	Source
API	Application Programming Interface. In this document, API is used synonymously with REST API.	This document
BUS	Business Applications	MEF 55.1
CUS	Customer Application Coordinator	MEF 55.1
IRP	Interface Reference Point	This document
OAS	OpenAPI Specification	openapis.org
SFT	Service Function Testing	Mplify 136.1
SOF	Service Orchestration Functionality	MEF 55.1

Table 3. Abbreviations

3. 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 [RFC2119], RFC 8174 [RFC8174]) 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.

A paragraph preceded by **[CRa]<** specifies a conditional mandatory requirement that **MUST** be followed if the condition(s) following the "<" have been met. For example, **"[CR1]<[D38]"** indicates that Conditional Mandatory Requirement 1 must be followed if Desirable Requirement 38 has been met. A paragraph preceded by **[CDb]<** specifies a Conditional Desirable Requirement that **SHOULD** be followed if the condition(s) following the "<" have been met. A paragraph preceded by **[COc]<** specifies a Conditional Optional Requirement that **MAY** be followed if the condition(s) following the "<" have been met.

4. Introduction

The Service Function Testing (SFT) API allows Buyers to create, retrieve, and update Test Profiles and Test Jobs, as well as receive notifications containing updates or changes to the state of Test Profiles and Test Jobs. This functionality enables the execution of tests during service verification, activation, or maintenance.

This standard specification document describes the Application Programming Interface (API) for Service Function Testing functionality of the LSO Allegro Interface Reference Point (IRP), LSO Interlude Interface Reference Point (IRP) and LSO Sonata IRP as defined in the *MEF 55.1 Lifecycle Service Orchestration (LSO): Reference Architecture and Framework* [MEF 55.1]. The LSO Reference Architecture is shown in Figure 1 with the three IRPs highlighted.

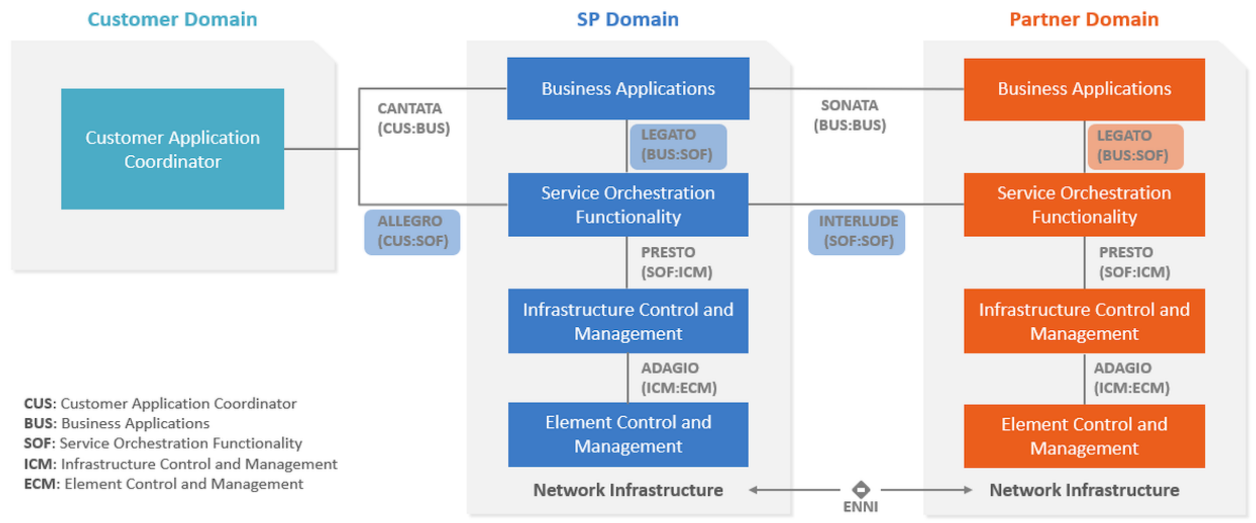

Customer Domain
SP Domain
Partner Domain
Customer Application Coordinator
CANTATA (CUS:BUS)
ALLEGRO (CUS:SOF)
Business Applications
LEGATO (BUS:SOF)
Service Orchestration Functionality
PRESTO (SOF:ICM)
Infrastructure Control and Management
ADAGIO (ICM:ECM)
Element Control and Management
Network Infrastructure
SONATA (BUS:BUS)
INTERLUDE (SOF:SOF)
ENNI
Business Applications
LEGATO (BUS:SOF)
Service Orchestration Functionality
PRESTO (SOF:ICM)
Infrastructure Control and Management
ADAGIO (ICM:ECM)
Element Control and Management
Network Infrastructure
CUS: Customer Application Coordinator
BUS: Business Applications
SOF: Service Orchestration Functionality
ICM: Infrastructure Control and Management
ECM: Element Control and Management

Figure 1. The LSO Reference Architecture

4.1. Description

The scope of this API and Developer Guide covers

- Service Function Testing
  - Includes management of Test Profiles and Test Jobs
- Service Function Testing Notification
  - Includes Event Subscription/Hub and Listener notification functions

The business requirements and use cases for Service Function Testing are defined in Mplify 136.1 Service Function Testing Business Requirements and Use Cases [Mplify 136.1].

This document supports interactions over the Legato interface within a single operator as well as interaction with Partner Domain and Customer Domain through Interlude and Allegro interfaces respectively.

Business Applications (BUS), Customer Application Coordinator (CUS) and Service Orchestration Functionality (SOF) systems use the information contained within this document.

This standard is intended to support the design of API implementations that enable interoperable SOF operations (in the scope of this standard) across the Allegro IRP, Interlude IRP, and Legato IRP.

This standard is based on TMF Open API (v4.1.0) for Service Test Management [TMF 653].

4.2. Conventions in the Document

- Code samples are formatted using code blocks. When notation `<< some text >>` is used in the payload sample it indicates that a comment is provided instead of an example value, and it might not comply with the OpenAPI definition.
- Model definitions are formatted as in-line code (e.g. `TestJob`).
- In UML diagrams the default cardinality of associations is `0..1`. Other cardinality markers are compliant with the UML standard.
- In the API details tables and UML diagrams required attributes are marked with a `*` next to their names.
- In UML sequence diagrams `{{variable}}` notation is used to indicate a variable to be substituted with a correct value.

4.3. Relation to Other Documents

This API implements the Service Function Testing related requirements and use cases that are defined in [Mplify 136.1]. The API definition builds on TMF Open API (v4.1.0) for Service Test Management [TMF 653]. Service Function Testing Use Cases must support the use of Mplify Service Specifications as payload.

4.4. Approach

As presented in Figure 2. the Allegro, Interlude, and Legato API frameworks consist of three structural components:

- Generic API framework
- Service-independent information (Function-specific information and Function-specific operations)
- Service-specific information (Mplify service specification data model)

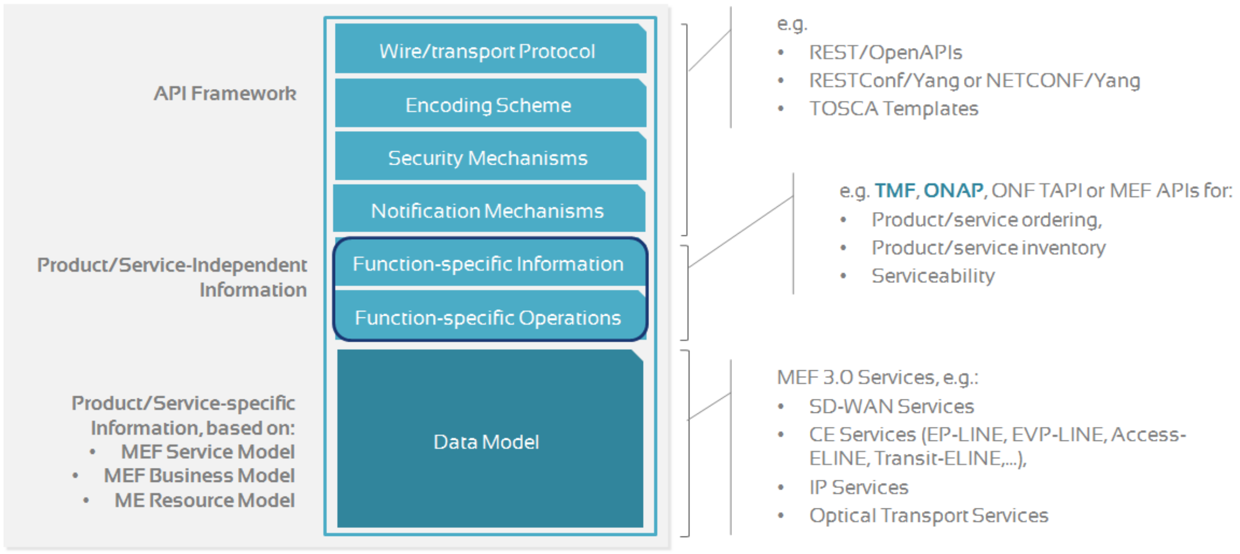

API Framework
Wire/transport Protocol
Encoding Scheme
Security Mechanisms
Notification Mechanisms
Product/Service-Independent Information
Function-specific Information
Function-specific Operations
Product/Service-specific Information, based on:
• MEF Service Model
• MEF Business Model
• ME Resource Model
Data Model
e.g.
• REST/OpenAPIs
• RESTConf/Yang or NETCONF/Yang
• TOSCA Templates
e.g. TMF, ONAP, ONF TAPI or MEF APIs for:
• Product/service ordering,
• Product/service inventory
• Serviceability
MEF 3.0 Services, e.g.:
• SD-WAN Services
• CE Services (EP-LINE, EVP-LINE, Access-ELINE, Transit-ELINE,...),
• IP Services
• Optical Transport Services

Figure 2. Allegro, Interlude and Legato API Structure

The essential concept behind the framework is to decouple the common structure, information, and operations from the specific service information content. Firstly, the Generic API Framework defines a set of design rules and patterns that are applied across all Allegro, Interlude, and Legato APIs. Secondly, the service-independent information of the framework focuses on a model of a particular Allegro, Interlude, or Legato functionality and is agnostic to any of the service specifications. For example, this standard is describing the Service Function Testing model and operations that allow creation of the service test for any service.

This Developer Guide does not define Mplify SFT Specifications but can be used in combination with any SFT Specifications defined by or compliant with Mplify.

Figure 3 presents the relationship between the Service Function Testing API entities and the SFT Specification model. The `serviceSpecificTestProfileConfiguration` serves as an extension point for configuring service-specific parameters. On the other hand, the `serviceSpecificTestJobConfiguration` acts as an extension point for configuring Test Measures. Finally, `serviceSpecificTestJobResultConfiguration` provides an extension point for capturing and representing the outcome of Service Function Testing.

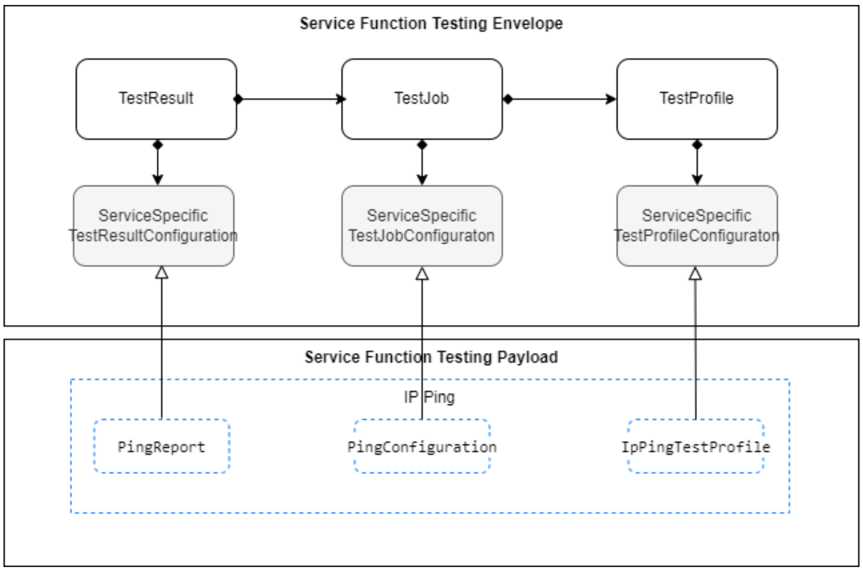
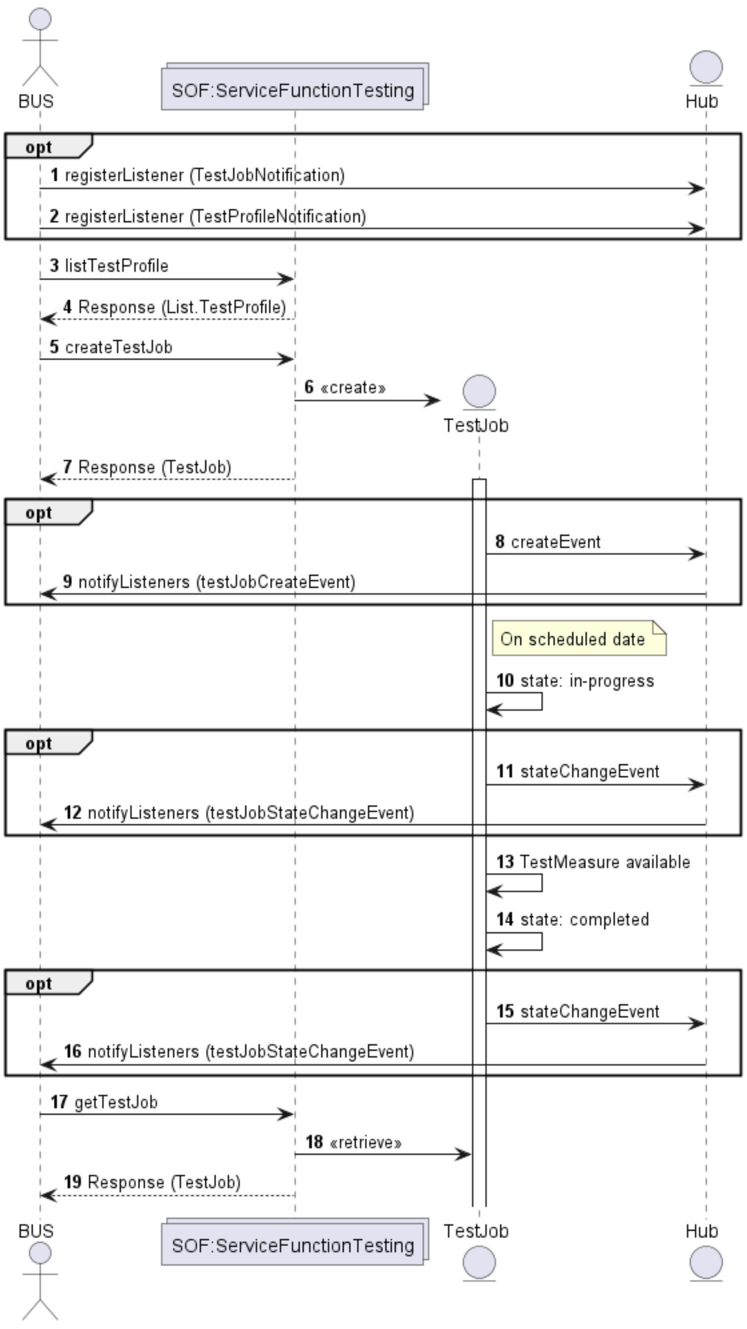

Service Function Testing Envelope
TestResult
TestJob
TestProfile
ServiceSpecific TestResultConfiguration
ServiceSpecific TestJobConfiguraton
ServiceSpecific TestProfileConfiguraton
Service Function Testing Payload
IP Ping
PingReport
PingConfiguration
IpPingTestProfile

Figure 3. Service specification for Allegro, Interlude, Legato

4.5. High-Level Flow

The Service Function Testing API in essence allows the BUS to request SOF to manage Test Profiles and Test Jobs. Typically, Test Profiles are associated with one or more Test Jobs, but a Test Job can be created without an associated Test Profile. In such cases, parameters normally provided by the Test Profile are included directly in the Test Job itself. The SFT Notification API facilitates the exchange of information about significant changes in the system state between interested parties Figure 4. presents an example of a high-level flow of Service Function Testing provisioning.



BUS
SOF:ServiceFunctionTesting
Hub
opt
1 registerListener (TestJobNotification)
2 registerListener (TestProfileNotification)
3 listTestProfile
4 Response (List.TestProfile)
5 createTestJob
6 «create»
TestJob
7 Response (TestJob)
opt
8 createEvent
9 notifyListeners (testJobCreateEvent)
On scheduled date
10 state: in-progress
opt
11 stateChangeEvent
12 notifyListeners (testJobStateChangeEvent)
13 TestMeasure available
14 state: completed
opt
15 stateChangeEvent
16 notifyListeners (testJobStateChangeEvent)
17 getTestJob
18 «retrieve»
19 Response (TestJob)
BUS
SOF:ServiceFunctionTesting
TestJob
Hub

Figure 4. High-Level Flow

The following steps describe the high-level flow:

- The BUS system registers listeners for notifications related to `TestJob` and `TestProfile` events via the Hub.
  Note1: SFT Notifications are optional and do not impact end-to-end flow
- The BUS system retrieves a list of `TestProfiles` by sending a request to the SOF system.
- When querying `TestProfile` instances the BUS system uses the *Service Function Testing API*.
- The BUS system initiates new Test Job by sending a request containing `TestJob` entity to the SOF system.
- The BUS system can start Test Job with or without `TestProfile` which is a template containing common configuration shared by multiple `TestJob` entities.
- During creation of new Test Job, the BUS uses the *Service Function Testing API* to instantiate the `TestJob`
  - The SOF starts Test Job by creating a `TestJob` entity which may or may not contain a reference to the `TestProfile`.
  - The `TestJob` is processed by the SOF as per the state transition rules described in 6.6.4.

- (optional) The SOF reports the `TestJob` state changes.
- On a scheduled date according to schedule definition, Test Job is started.
- (optional) The SOF reports the `TestJob` state change.
- The BUS system retrieves `TestJob` containing `ServiceSpecificTestJobConfiguration` through *Service Function Testing API*

The same *Service Function Testing API* is used by the BUS to create **new** `TestJob` instances, as well as update **existing** ones or trigger state transitions.

Figure 5 presents relations between entities that are managed through *Service Function Testing API*. The diagram is simplified and does not contain all types of objects.

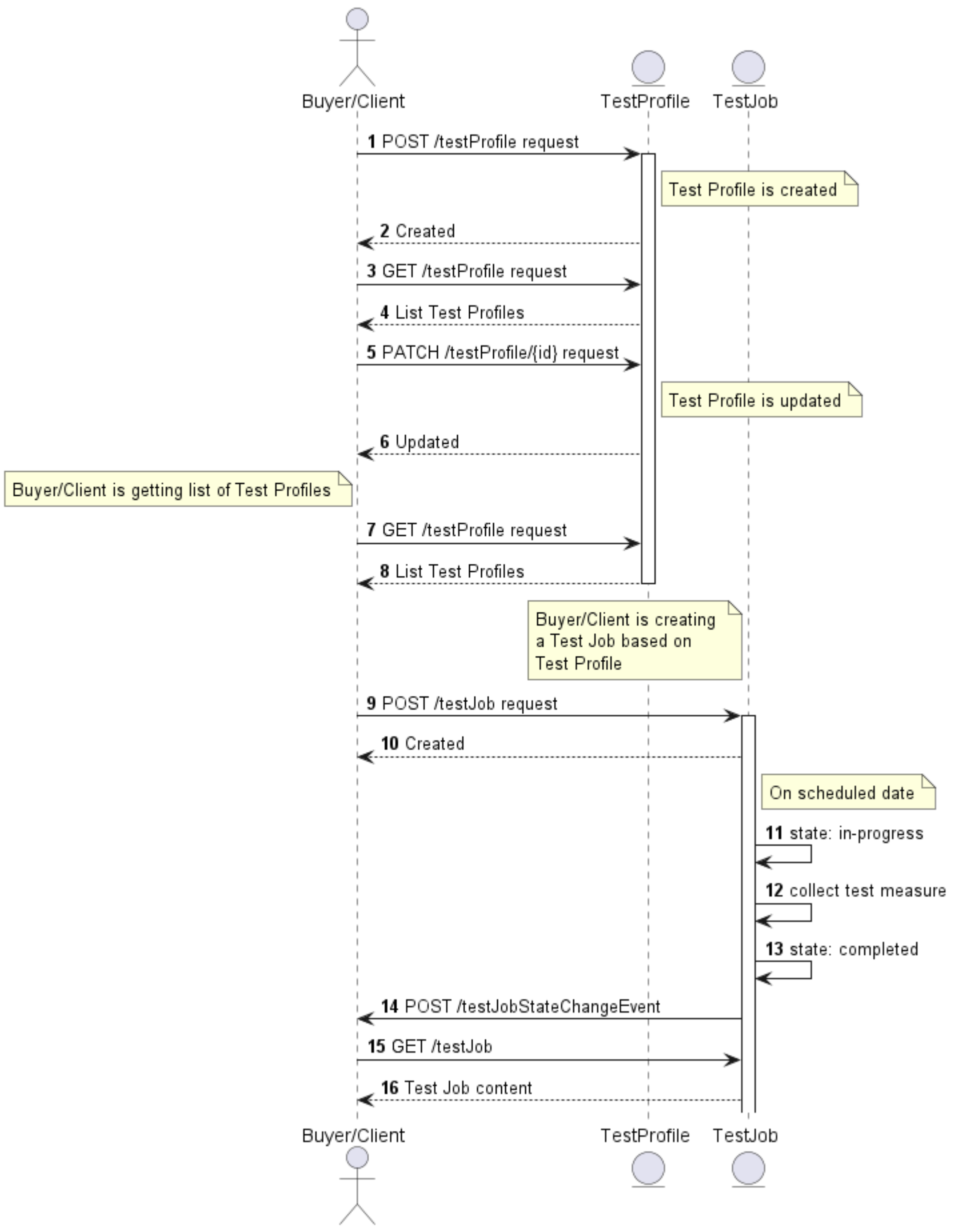


Figure 5. The flow between API endpoints

5. API Description

This section presents the API structure and design patterns. It starts with the high-level use cases diagram. Then it describes the REST endpoints with use case mapping. Next, it explains the design pattern that is used to combine service-agnostic and service-specific parts of API payloads. Finally, payload validation and API security aspects are discussed.

5.1. High-level use cases

Figures 6, 7 and 8 presents a high-level use case diagrams. They aim to help understand the endpoint mapping. Use cases are described extensively in chapter 6.

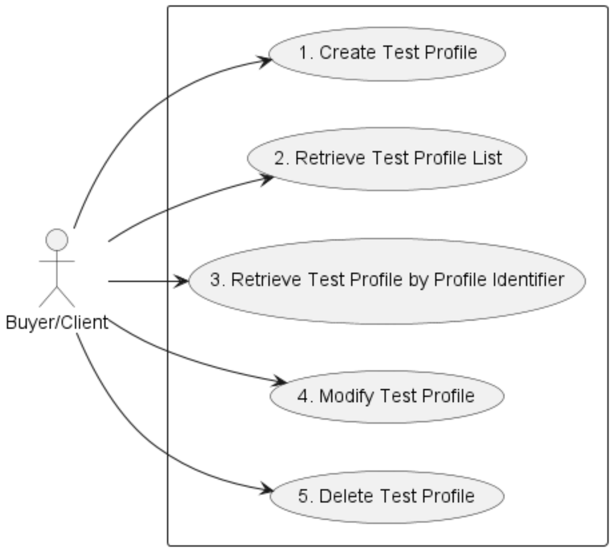


Figure 6. Test Profile Use cases

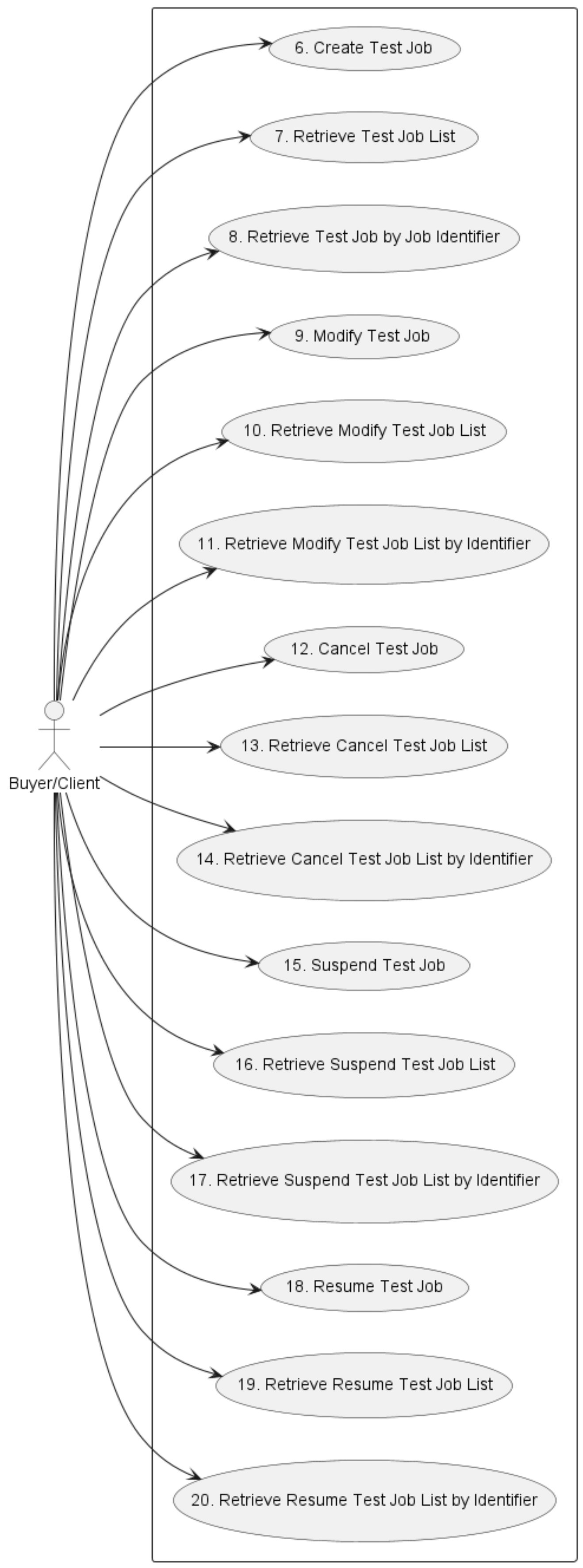

6. Create Test Job
7. Retrieve Test Job List
8. Retrieve Test Job by Job Identifier
9. Modify Test Job
10. Retrieve Modify Test Job List
11. Retrieve Modify Test Job List by Identifier
12. Cancel Test Job
13. Retrieve Cancel Test Job List
14. Retrieve Cancel Test Job List by Identifier
15. Suspend Test Job
16. Retrieve Suspend Test Job List
17. Retrieve Suspend Test Job List by Identifier
18. Resume Test Job
19. Retrieve Resume Test Job List
20. Retrieve Resume Test Job List by Identifier
Buyer/Client

Figure 7. Test Job Use cases

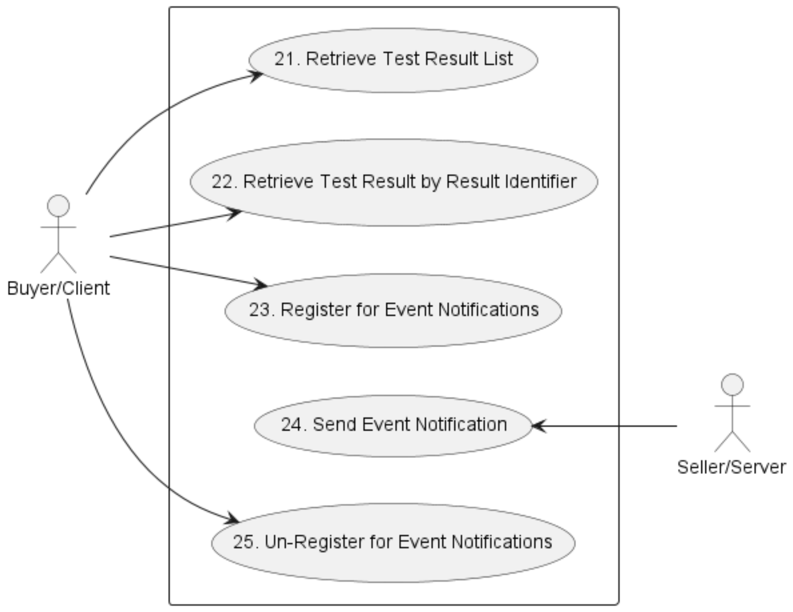

21. Retrieve Test Result List
22. Retrieve Test Result by Result Identifier
23. Register for Event Notifications
24. Send Event Notification
25. Un-Register for Event Notifications
Buyer/Client
Seller/Server

Figure 8. Test Result and Notification Use cases

5.2. API Endpoint and Operation Description

5.2.1. Seller/Server (SOF) side Service Function Testing API Endpoints

Base URL for Allegro:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/allegro/serviceFunctionTesting/v3/
```

Base URL for Interlude:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/interlude/serviceFunctionTesting/v3/
```

Base URL for Legato:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/legato/serviceFunctionTesting/v3/
```

The following API endpoints are implemented by the Seller/Server (SOF) and allow the Buyer/Client (SOF/CUS/BUS) to create, retrieve and modify `TestJob` and `TestProfile` instances. The endpoints and corresponding data model are defined in `serviceApi/sft/serviceFunctionTest.api.yaml`.

API Endpoint	**Description**	**Mplify 136.1 Use Case Mapping**
POST /testProfile	A request initiated by the Buyer/Client to create a Test Profile in the Seller/Server system.	1
PATCH /testProfile/{id}	A request initiated by the Buyer/Client to partially modify a Test Profile in the Seller/Server system.	2
DELETE /testProfile/{id}	A request initiated by the Buyer/Client to delete a Test Profile in the Seller/Server system.	3

API Endpoint	Description	Mplify 136.1 Use Case Mapping
GET /testProfile	The Buyer/Client requests a list of Test Profiles based on a set of filter criteria.	4
GET /testProfile/{id}	The Buyer/Client requests detailed information about a single Test Profile.	5
POST /testJob	A request initiated by the Buyer/Client to create a Test Job in the Seller/Server system.	6,7
GET /testResult	The Buyer/Client requests a list of Test Results based on a set of filter criteria.	8
GET /testResult/{id}	The Buyer/Client requests detailed information about a single Test Result.	9
POST /suspendTestJob	A request initiated by the Buyer/Client to create a Suspend Test Job in the Seller/Server system.	10
POST /resumeTestJob	A request initiated by the Buyer/Client to create a Resume Test Job in the Seller/Server system.	11
POST /cancelTestJob	A request initiated by the Buyer/Client to create a Cancel Test Job in the Seller/Server system.	12
POST /modifyTestJob	A request initiated by the Buyer/Client to Modify a Test Job in the Seller/Server system.	13,14
GET /testJob	The Buyer/Client requests a list of Test Jobs based on a set of filter criteria.	15
GET /testJob/{id}	The Buyer/Client requests detailed information about a single Test Job.	16
GET /suspendTestJob	The Buyer/Client requests a list of Suspend Test Jobs based on a set of filter criteria.	20
GET /suspendTestJob/{id}	The Buyer/Client requests detailed information about a single Suspend Test Job.	21
GET /resumeTestJob	The Buyer/Client requests a list of Resume Test Jobs based on a set of filter criteria.	22
GET /resumeTestJob/{id}	The Buyer/Client requests detailed information about a single Resume Test Job.	23
GET /cancelTestJob	The Buyer/Client requests a list of Cancel Test Jobs based on a set of filter criteria.	24
GET /cancelTestJob/{id}	The Buyer/Client requests detailed information about a single Cancel Test Job.	25
GET /modifyTestJob	The Buyer/Client requests a list of Modify Test Jobs based on a set of filter criteria.	26
GET /modifyTestJob/{id}	The Buyer/Client requests detailed information about a single Modify Test Job.	27

Table 4. Seller/Server (SOF) Service Function Testing mandatory API endpoints

[R1] Seller/Server (SOF) **MUST** support all API endpoints listed in Table 4.

API endpoints listed in Table 5 are optional and may be exposed by the SOF.

API Endpoint	Description	Mplify 136.1 Use Case Mapping
POST /hub	The Buyer/Client requests to subscribe to the Test Job and/or Test Profile Notifications.	17
GET /hub/{id}	The Buyer/Client retrieves a specific `EventSubscription` from the SOF, that matches the *`id`* value provided as *`path`* parameter.	
DELETE /hub/{id}	The Buyer/Client requests to unsubscribe from the Test Job and/or Test Profile Notifications.	19

Table 5. Seller/Server (SOF) Service Function Testing optional API endpoints

[O1] The implementation **MAY** support API endpoints listed in Table 5.

5.2.2. Buyer/Client (CUS, BUS, SOF) side Service Function Testing API Endpoints

Base URL for Allegro:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/allegro/serviceFunctionTestingNotification/v3/
```

Base URL for Interlude:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/interlude/serviceFunctionTestingNotification/v3/
```

Base URL for Legato:

```
https://{{serverBase}}:{{port}}
{{?/sof_prefix}}/mefApi/legato/serviceFunctionTestingNotification/v3/
```

The following API Endpoints are used by SOF to post notifications to registered CUS, BUS, or SOF listeners. The endpoints and corresponding data model are defined in `serviceApi/sft/serviceFunctionTestNotification.api.yaml`

API Endpoint	Description	Mplify 136.1 Use Case Mapping
POST /listener/testJobCreateEvent	A request initiated by the Seller/Server to notify Buyer/Client on `TestJob` instance creation.	18
POST /listener/testJobAttributeValueChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `TestJob` instance attribute value change.	18
POST /listener/testJobStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `TestJob` instance state change.	18

API Endpoint	Description	Mplify 136.1 Use Case Mapping
POST /listener/cancelTestJobStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `CancelTestJob` instance state change.	18
POST /listener/modifyTestJobStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `ModifyTestJob` instance state change.	18
POST /listener/suspendTestJobStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `SuspendTestJob` instance state change.	18
POST /listener/resumeTestJobStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `ResumeTestJob` instance state change.	18
POST /listener/testProfileCreateEvent	A request initiated by the Seller/Server to notify Buyer/Client on `TestProfile` instance creation.	18
POST /listener/testProfileAttributeValueChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `TestProfile` instance attribute value change.	18
POST /listener/testProfileLifecycleStateChangeEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `TestProfile` instance state change.	18
POST /listener/testProfileDeleteEvent	A request initiated by the Seller/Server to notify Buyer/Client on `TestProfile` instance deletion.	18
POST /listener/testResultCreateEvent	A request initiated by the Seller/Server to notify Buyer/Client on the `TestResult` instance creation.	18

Table 6. Buyer/Client (CUS, BUS, SOF) Service Function Testing API endpoints

[O2] The Buyer/Client (CUS, BUS, SOF) **MAY** support API endpoints listed in Table 6.

[O3] The Buyer/Client (CUS, BUS, SOF) **MAY** register to receive Service Function Testing notifications.

[R2] The Seller/Server **MUST** support sending notifications to API endpoints listed in Table 6 to the registered Buyer/Client.

5.3. Integration of Service Testing Specification into Service Function Testing API

Service Function Testing API discussed in this document is a generic envelope that allows for the lifecycle management of relevant Service Function Testing objects. The API itself does not provide explicit definitions for configuring service testing or prescribing the structure of output data. However, it offers flexible extensibility to accommodate the configuration of service-specific testing objectives and results. This allows for customization and adaptation to various testing requirements and desired data formats. This testing configuration and result schemas are defined using JsonSchema (draft 7) format JSON Schema draft 7 and can be integrated into the `TestJob`, `TestProfile` and `TestResult` using the TMF extension pattern.

The extension hosting types in the API data model are:

- `ServiceSpecificTestProfileConfiguration` - this type is extended with Service Specific Test Profile attributes that define how a test is performed for a given Test Specification.
- `ServiceSpecificTestJobConfiguration` - this type is extended with Test Measure attributes schema
- `ServiceSpecificTestResultConfiguration` - this type is extended with Test Result attributes schema

The `@type` attribute of those extension hosting types must be set to a value that uniquely identifies the service testing configuration. A unique identifier for Mplify standard service schemas is in URN format and is assigned by Mplify. This identifier is provided as root schema `$id`. Use of Non-Mplify standard service testing configuration is allowed. In such a case the schema identifier must be agreed upon between the Buyer/Client and the Seller/Server.

The example below shows a header of a schema, which describes IP Service Function Testing Ping Configuration Schema, where `"$id": urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all` is the above-mentioned URN:

```
$schema: http://json-schema.org/draft-07/schema#
$id: urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all
x-mef-target: ServiceSpecificTestJobConfiguration
description: IP Service Function Testing Ping Configuration Schema
```

Service Testing configuration payload is introduced in SFT API entities through a `serviceSpecificTestProfileConfiguration` attribute of type `ServiceSpecificTestProfileConfiguration`, which is used as an extension point for configuration attributes.

In terms of test measures and test results, the appropriate payloads are introduced via `ServiceSpecificTestJobConfiguration` and `ServiceSpecificTestResultConfiguration` respectively.

Implementations might choose to integrate selected Service Function Testing specifications to data model during development. In such a case an integrated data model is built, and specifications are placed in an inheritance relationship with either `ServiceSpecificTestProfileConfiguration`, `ServiceSpecificTestJobConfiguration` or `ServiceSpecificTestResultConfiguration` as described in the OAS specification. This pattern is referred to as **Static Binding**. The snippets below present an example of a static binding of the envelope API with exemplary Mplify SFT specifications, for each extension point.

```
ServiceSpecificTestProfileConfiguration:
  description:
    ServiceSpecificTestProfileConfiguration is used as an extension point
    for  for schema that define how a test is performed for a given Test
    Specification. The `@type` attribute is used as a discriminator.
  discriminator:
    mapping:
      urn:mef:lso:spec:legato:ip-ping-test-profile:v0.0.1:all: '#/components/schemas/IpPingTestProfile'
    propertyName: '@type'
  properties:
    '@type':
      description:
        The named type must be a subclass of
        ServiceSpecificTestProfileConfiguration.
      enum:
        - urn:mef:lso:spec:legato:ip-ping-test-profile:v0.0.1:all
      type: string
  required:
    - '@type'
  type: object
```

```
IpPingTestProfile:
  allOf:
    - $ref: '#/components/schemas/ServiceSpecificTestProfileConfiguration'
    - description: IP Ping Test Profile Schema
```

```
ServiceSpecificTestJobConfiguration:
  description:
    ServiceSpecificTestJobConfiguration is used as an extension point for
    schema to be used that defines the Test Measure attributes. The `@type`
    attribute is used as a discriminator.
  discriminator:
    mapping:
      urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all: '#/components/schemas/PingConfiguration'
      urn:mef:lso:spec:service:bfd-configuration:v0.0.1:all: '#/components/schemas/BfdConfiguration'
      urn:mef:lso:spec:service:twamp-configuration:v0.0.1:all: '#/components/schemas/TwampConfiguration'
    propertyName: '@type'
  properties:
    '@type':
      description:
        The named type must be a subclass of
        ServiceSpecificTestJobConfiguration.
      enum:
        - urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all
        - urn:mef:lso:spec:service:bfd-configuration:v0.0.1:all
        - urn:mef:lso:spec:service:twamp-configuration:v0.0.1:all
      type: string
  required:
    - '@type'
  type: object
```

```
PingConfiguration:
  allOf:
    - $ref: '#/components/schemas/ServiceSpecificTestJobConfiguration'
    - description: IP Service Function Testing Ping Configuration Schema
BfdConfiguration:
  allOf:
    - $ref: '#/components/schemas/ServiceSpecificTestJobConfiguration'
    - description: IP Service Function Testing BFD Configuration Schema.
TwampConfiguration:
  allOf:
    - $ref: '#/components/schemas/ServiceSpecificTestJobConfiguration'
    - description: IP Service Function Testing TWAMP Configuration Schema
```

```
ServiceSpecificTestResultConfiguration:
  description:
    ServiceSpecificTestResultConfiguration is used as an extension point for
```

```
      schema to be used that defines the Test Result attributes. The `@type`
      attribute is used as a discriminator.
    discriminator:
      mapping:
        urn:mef:lso:spec:legato:ping-report:v0.0.1:all: '#/components/schemas/PingReport'
        urn:mef:lso:spec:legato:bfd-report:v0.0.1:all: '#/components/schemas/BfdReport'
        urn:mef:lso:spec:service:twamp-report:v0.0.1:all: '#/components/schemas/TwampReport'
      propertyName: '@type'
    properties:
      '@type':
        description:
          The named type must be a subclass of ServiceSpecificTestJobResult.
        enum:
          - urn:mef:lso:spec:legato:ping-report:v0.0.1:all
          - urn:mef:lso:spec:legato:bfd-report:v0.0.1:all
          - urn:mef:lso:spec:service:twamp-report:v0.0.1:all
        type: string
    required:
      - '@type'
    type: object
```

```
  PingReport:
    allOf:
      - $ref: '#/components/schemas/ServiceSpecificTestResultConfiguration'
      - description: IP Service Function Testing Ping Results Schema.
  BfdReport:
    allOf:
      - $ref: '#/components/schemas/ServiceSpecificTestResultConfiguration'
      - description: IP Service Function Testing BFD Report Schema.
  TwampReport:
    allOf:
      - $ref: '#/components/schemas/ServiceSpecificTestResultConfiguration'
      - description: IP Service Function Testing TWAMP Results Schema
```

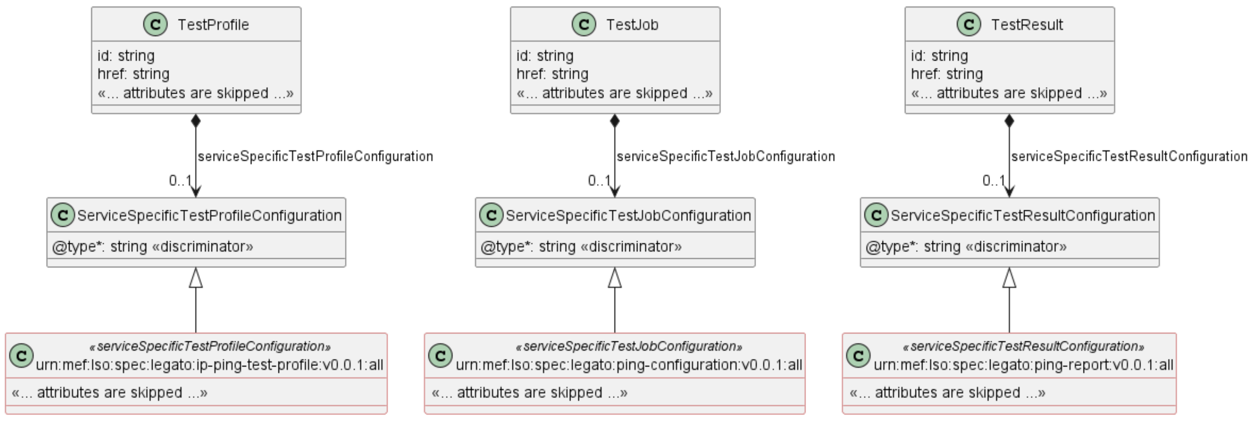
Alternatively, implementations might choose not to build an integrated model and choose a different mechanism allowing runtime validation of service-specific fragments of the payload. The system can validate a given configuration against a new schema without redeployment. This pattern is called **Dynamic Binding.**

Regardless of the chosen implementation pattern, the HTTP payload is the same. Both implementation approaches must conform to the requirements specified below.

[R3] `ServiceSpecificTestProfileConfiguration`, `ServiceSpecificTestJobConfiguration` and `ServiceSpecificTestResultConfiguration` types are extension points that **MUST** be used to integrate service specific test profile, job and result properties into a request/response payload.

[R4] The `@type` property of `ServiceSpecificTestProfileConfiguration`, `ServiceSpecificTestJobConfiguration` and `ServiceSpecificTestResultConfiguration` **MUST** be used to specify the type of the extending entity.

[R5] Attributes specified in the payload must conform to the test definition specified in the `@type` property.



TestProfile
id: string
href: string
«... attributes are skipped ...»
serviceSpecificTestProfileConfiguration
0..1
ServiceSpecificTestProfileConfiguration
@type*: string «discriminator»
«serviceSpecificTestProfileConfiguration»
urn:mef:lso:spec:legato:ip-ping-test-profile:v0.0.1:all
«... attributes are skipped ...»
TestJob
id: string
href: string
«... attributes are skipped ...»
serviceSpecificTestJobConfiguration
0..1
ServiceSpecificTestJobConfiguration
@type*: string «discriminator»
«serviceSpecificTestJobConfiguration»
urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all
«... attributes are skipped ...»
TestResult
id: string
href: string
«... attributes are skipped ...»
serviceSpecificTestResultConfiguration
0..1
ServiceSpecificTestResultConfiguration
@type*: string «discriminator»
«serviceSpecificTestResultConfiguration»
urn:mef:lso:spec:legato:ping-report:v0.0.1:all
«... attributes are skipped ...»

Figure 9. The Extension Pattern with Sample Service-Specific Extension

Figure 9 presents Mplify Service Function Testing schemas that represent test profile, job and result classes for IP services. When these schemas are used, the `@type` of `ServiceSpecificTestProfileConfiguration` takes `"urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all"` value to indicate which service specific attributes that define how a test is performed for a given test specification should be included in the payload. Similarly, for `ServiceSpecificTestJobConfiguration`, the `@type` attribute takes `"urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all"` value. Finally, for `ServiceSpecificTestResultConfiguration`, the `@type` attribute takes `"urn:mef:lso:spec:legato:ping-report:v0.0.1:all"` value which indicates how the test result collection should be interpreted.

5.4. Model structure and validation

The structure of the payloads exchanged via Allegro, Interlude, and Legato Service Function Testing API endpoints is defined using:

- OpenAPI version 3.0 for the service-agnostic part of the payload
- JsonSchema (draft 7) for the service-specific part of the payload

[R6] Implementations **MUST** use payloads that conform to these definitions.

5.5. Security Considerations

Although the Legato IRP is internal to a Service Provider/Operator business boundary, it is expected that some minimal security mechanisms are in place for any communication over this IRP. There must also be authorization mechanisms in place to control what a particular Buyer/Client or SOF is allowed to do and what information may be obtained. For Allegro and Interlude IRPs, security should follow rules for external communication. The definition of the exact security mechanism and configuration is outside the scope of this document. The LSO Security mechanisms are defined by MEF 128.1 *LSO API Security Profiles* [MEF 128.1].

6. API Interactions and Flows

This section provides a detailed insight into the API functionality, use cases, and flows. It starts with Table 7 presenting a list and short description of all business use cases then present the variants of end-to-end interaction flows, and in the following subchapters describe the API usage flow and examples for each of the use cases.

Use Case #	Use Case Name	Use Case Description	Mplify 136.1 Use Case Mapping
1	Create Test Profile	A request initiated by the Buyer/Client to create a Test Profile in the Seller/Server system.	1
2	Retrieve List of Test Profiles	The Buyer/Client requests a list of Test Profiles based on a set of filter criteria. The Seller/Server returns a summarized list of Test Profiles.	4
3	Retrieve Test Profile by Profile Identifier	The Buyer/Client requests detailed information about a single Test Profile based on the Test Profile Identifier.	5
4	Modify Test Profile	A request initiated by the Buyer/Client to modify a Test Profile in the Seller/Server system based on a Test Profile Identifier.	2
5	Delete Test Profile	The Buyer/Client requests deletion of the Test Profile by specifying the Test Profile Identifier.	3
6	Create Test Job	A request initiated by the Buyer/Client to create a Test Job in the Seller/Server system	6,7
7	Retrieve List of Test Jobs	The Buyer/Client requests a list of Test Jobs based on a set of filter criteria. The Seller/Server returns a summarized list of Test Jobs.	15
8	Retrieve Test Job by Job Identifier	The Buyer/Client requests detailed information about a single Test Job based on the Test Job Identifier.	16
9	Modify Test Job	A request initiated by the Buyer/Client to Modify a Test Job in the Seller/Server system.	13
10	Retrieve List of Modify Test Jobs	The Buyer/Client requests a list of Modify Test Job based on a set of filter criteria. The Seller/Server returns a summarized list of Modify Test Jobs.	26
11	Retrieve Modify Test Job by Job Identifier	The Buyer/Client requests detailed information about a single Modify Test Job based on the Modify Test Job Identifier.	27
12	Cancel Test Job	A request initiated by the Buyer/Client to Cancel a Test Job in the Seller/Server system.	12
13	Retrieve List of Cancel Test Jobs	The Buyer/Client requests a list of Cancel Test Job based on a set of filter criteria. The Seller/Server returns a summarized list of Cancel Test Jobs.	24

Use Case #	Use Case Name	Use Case Description	Mplify 136.1 Use Case Mapping
14	Retrieve Cancel Test Job by Job Identifier	The Buyer/Client requests detailed information about a single Cancel Test Job based on the Cancel Test Job Identifier.	25
15	Suspend Test Job	A request initiated by the Buyer/Client to Suspend a Test Job in the Seller/Server system.	10
16	Retrieve List of Suspend Test Jobs	The Buyer/Client requests a list of Suspend Test Job based on a set of filter criteria. The Seller/Server returns a summarized list of Suspend Test Jobs.	20
17	Retrieve Suspend Test Job by Job Identifier	The Buyer/Client requests detailed information about a single Suspend Test Job based on the Suspend Test Job Identifier.	21
18	Resume Test Job	A request initiated by the Buyer/Client to Resume a Test Job in the Seller/Server system.	11
19	Retrieve List of Resume Test Jobs	The Buyer/Client requests a list of Resume Test Job based on a set of filter criteria. The Seller/Server returns a summarized list of Resume Test Jobs.	22
20	Retrieve Resume Test Job by Job Identifier	The Buyer/Client requests detailed information about a single Resume Test Job based on the Resume Test Job Identifier.	23
21	Retrieve List of Test Results	The Buyer/Client requests a list of Test Jobs based on a set of filter criteria. The Seller/Server returns a summarized list of Test Jobs.	8
22	Retrieve Test Result by Result Identifier	The Buyer/Client requests detailed information about a single Test Job based on the Test Job Identifier.	9
23	Register for Event Notifications	The Buyer/Client requests to subscribe to Test Profile and/or Test Job Notifications.	17
24	Send Event Notification	A request initiated by the Seller/Server to notify the Buyer/Client.	19
25	Unregister for Event Notifications	The Buyer/Client requests to unsubscribe to Test Profile and/or Test Job Notifications.	18

Table 7. Use cases description

6.1. Use Case 1: Create a Test Profile

Test Profile is a template that is used to simplify the Test Job provisioning. Common attributes can be defined in the Test Profile which can be centralized and leveraged across multiple Test Jobs.

6.1.1. Interaction flow

The flow of this use case is described in Figure 10.

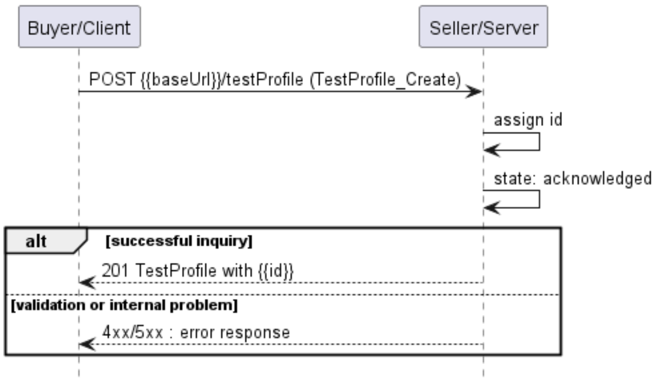

Buyer/Client
Seller/Server
POST {{baseUrl}}/testProfile (TestProfile_Create)
assign id
state: acknowledged
alt
[successful inquiry]
201 TestProfile with {{id}}
[validation or internal problem]
4xx/5xx : error response

Figure 10. Use Case 1 - Test Profile create request flow

The Buyer/Client sends a request with a `TestProfile_Create` type in the body. The SOF performs request validation, assigns an `id`, and returns `TestProfile` type in the response body, with a `state` set to `acknowledged`. From this point, the Test Profile will undergo further validations before it is ready to be used, and its state is set to `completed`. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `TestProfile`. The two patterns are presented in the following diagrams.

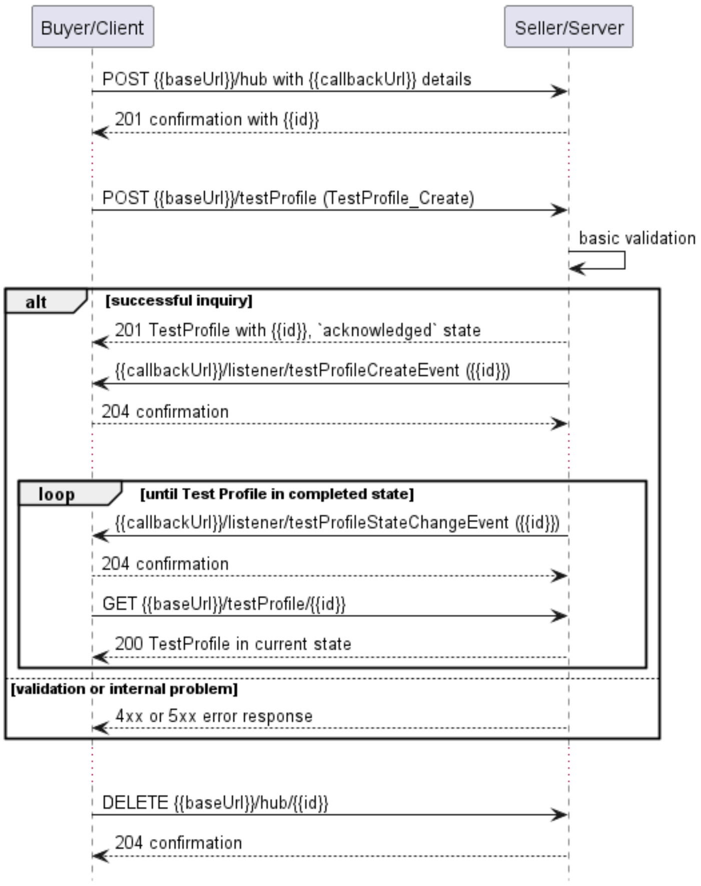

Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/testProfile (TestProfile_Create)
basic validation
alt
[successful inquiry]
201 TestProfile with {{id}}, `acknowledged` state
{{callbackUrl}}/listener/testProfileCreateEvent ({{id}})
204 confirmation
loop
[until Test Profile in completed state]
{{callbackUrl}}/listener/testProfileStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/testProfile/{{id}}
200 TestProfile in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 11. Test Profile progress tracking - Notifications

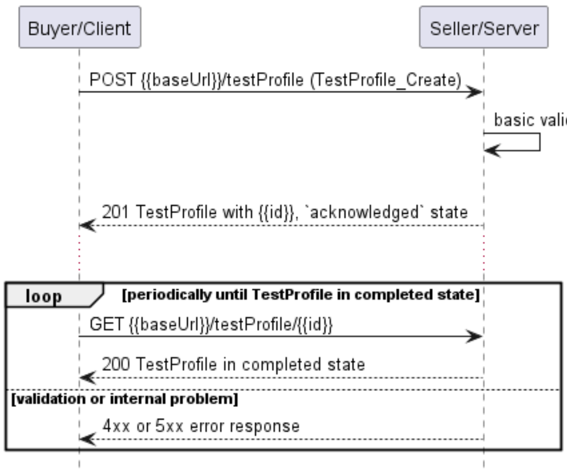

Buyer/Client
Seller/Server
POST {{baseUrl}}/testProfile (TestProfile_Create)
basic validation
201 TestProfile with {{id}}, `acknowledged` state
loop
[periodically until TestProfile in completed state]
GET {{baseUrl}}/testProfile/{{id}}
200 TestProfile in completed state
[validation or internal problem]
4xx or 5xx error response

Figure 12. Test Profile progress tracking - Polling

Note: The context of notifications is not a part of the considered use case itself. It is presented to show the big picture of end-to-end flow. This applies also to all further use case flow diagrams with notifications.

6.1.2. Create Test Profile Request

Figure 13 presents the most important part of the data model used during the Create Test Profile request (`POST /testProfile`) and response. The model of the request message - `TestProfile_Create` is a subset of the `TestProfile_Common` model and contains only attributes that can (or must) be set by the requestor. The Seller/Server then enriches the entity in the response with additional information.

Note: `TestProfile_Create` is an entity used by the Buyer/Client to make a request. `TestProfile` is an entity used by the Seller/Server to provide a response. The request entity has a subset of attributes of the response entity. Thus for the visibility of these shared attributes `TestProfile_Common` has been introduced. However, this class is not to be used directly in the exchange.

A `TestProfile_Create` defines details of the execution of the `TestJob` that will use the profile as a template. This includes parameters that can be shared by multiple Test Jobs.

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

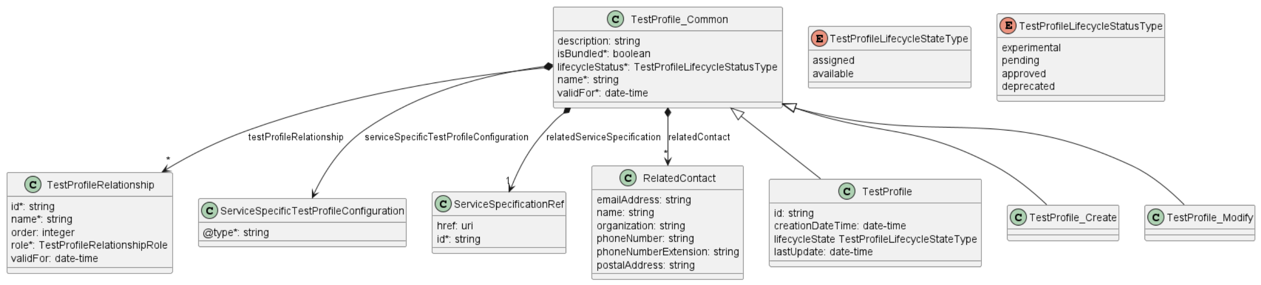


Figure 13. Test Profile Key Entities

To send a request the Buyer/Client uses the `createTestProfile` operation from the API. The snippet below presents an example of a Create Test Profile request:

Test Profile Create Request

```
{
  "name": "Basic IP Ping Test Profile",
  "description": "Test profile to perform IP ping operations on a cloud-connected endpoint.",
  "isBundled": false,
  "lifecycleStatus": "approved",
  "validFor": "2025-12-31T23:59:59Z",
  "relatedServiceSpecification": {
    "id": "svc-spec-001",
    "href": "https://example.com/services/svc-spec-001"
  },
  "relatedContact": [
    {
      "name": "John Doe",
      "organization": "NetworkOps Inc.",
      "emailAddress": "john.doe@example.com",
      "phoneNumber": "+1-555-123456",
      "postalAddress": "1234 Test Lane, Test City, TC 12345"
    }
  ],
  "serviceSpecificTestProfileConfiguration": {
    "@type": "urn:mef:lso:spec:legato:ip-ping-test-profile:v0.0.1:all",
    "interface": {
      "name": "Cloud Location A",
      "description": "Primary test location",
      "cloudService": true,
      "ipvcEndpoint": ["endpoint-1"]
    },
    "vlan": 200,
    "sourceIpAddress": {
      "ipv4": ["192.168.1.1"]
    },
    "destinationIpAddress": {
      "ipv4": ["192.168.1.100"]
    },
    "transmissionInterval": {
      "amount": 5,
      "units": "seconds"
    },
    "protocol": "IPV4",
    "count": 50,
    "sweepmaxsize": 1500,
    "sweepminsize": 100,
    "sweepincrement": 100,
    "wait": 1,
    "preload": 5,
    "mask": "255.255.255.0",
    "timeToLive": 64,
    "pattern": "0xAA",
    "packetSize": 512,
    "timeout": 2,
    "waitTime": 3,
    "typeOfService": 0
  }
}
```

[R7] The Buyer/Client Create Test Profile request **MUST** provide the following attributes: [Mplify 136.1 R1]

- `name`
- `lifecycleStatus`
- `validFor`

[O4] The Buyer/Client Create Test Profile request **MAY** contain any other attributes.

6.1.3. Create Test Profile Response

Entities used for providing a response to the Create Test Profile request are presented in Figure 13. The Seller/Server responds with a `TestProfile` type, which adds some attributes to the `TestProfile_Create` that was used in the Buyer/Client request.

Note: The term "Response Code" used in the Business Requirements maps to HTTP response code, where `2xx` indicates *Success* and `4xx` or `5xx` indicate *Failure*. This applies also to all further use cases with response.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

Test Profile Create Response

```
{
  "id": "tp-001",
  "href": "https://example.com/testProfiles/tp-001",
  "name": "Basic IP Ping Test Profile",
  "description": "Test profile to perform IP ping operations on a cloud-connected endpoint.",
  "isBundled": false,
  "lifecycleStatus": "approved",
  "lifecycleState": "available",
  "creationDate": "2025-06-10T10:00:00Z",
  "lastUpdate": "2025-06-12T14:30:00Z",
  "validFor": "2025-12-31T23:59:59Z",
  "relatedServiceSpecification": {
    "id": "svc-spec-001",
    "href": "https://example.com/services/svc-spec-001"
  },
  "relatedContact": [
    {
      "name": "John Doe",
      "organization": "NetworkOps Inc.",
      "emailAddress": "john.doe@example.com",
      "phoneNumber": "+1-555-123456",
      "postalAddress": "1234 Test Lane, Test City, TC 12345"
    }
  ],
  "serviceSpecificTestProfileConfiguration": {
    "@type": "urn:mef:lso:spec:legato:ip-ping-test-profile:v0.0.1:all",
    "interface": {
      "name": "Cloud Location A",
      "description": "Primary test location",
      "cloudService": true,
      "ipvcEndpoint": ["endpoint-1"]
    },
    "vlan": 200,
    "sourceIpAddress": {
      "ipv4": ["192.168.1.1"]
    },
    "destinationIpAddress": {
      "ipv4": ["192.168.1.100"]
    },
    "transmissionInterval": {
      "amount": 5,
      "units": "seconds"
    },
    "protocol": "IPV4",
    "count": 50,
    "sweepmaxsize": 1500,
    "sweepminsize": 100,
    "sweepincrement": 100,
    "wait": 1,
    "preload": 5,
    "mask": "255.255.255.0",
    "timeToLive": 64,
    "pattern": "0xAA",
    "packetSize": 512,
    "timeout": 2,
    "waitTime": 3,
    "typeOfService": 0
  }
}
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R8] The Seller/Server's response **MUST** include all and unchanged attributes' values as provided by the Buyer/Client in the request.

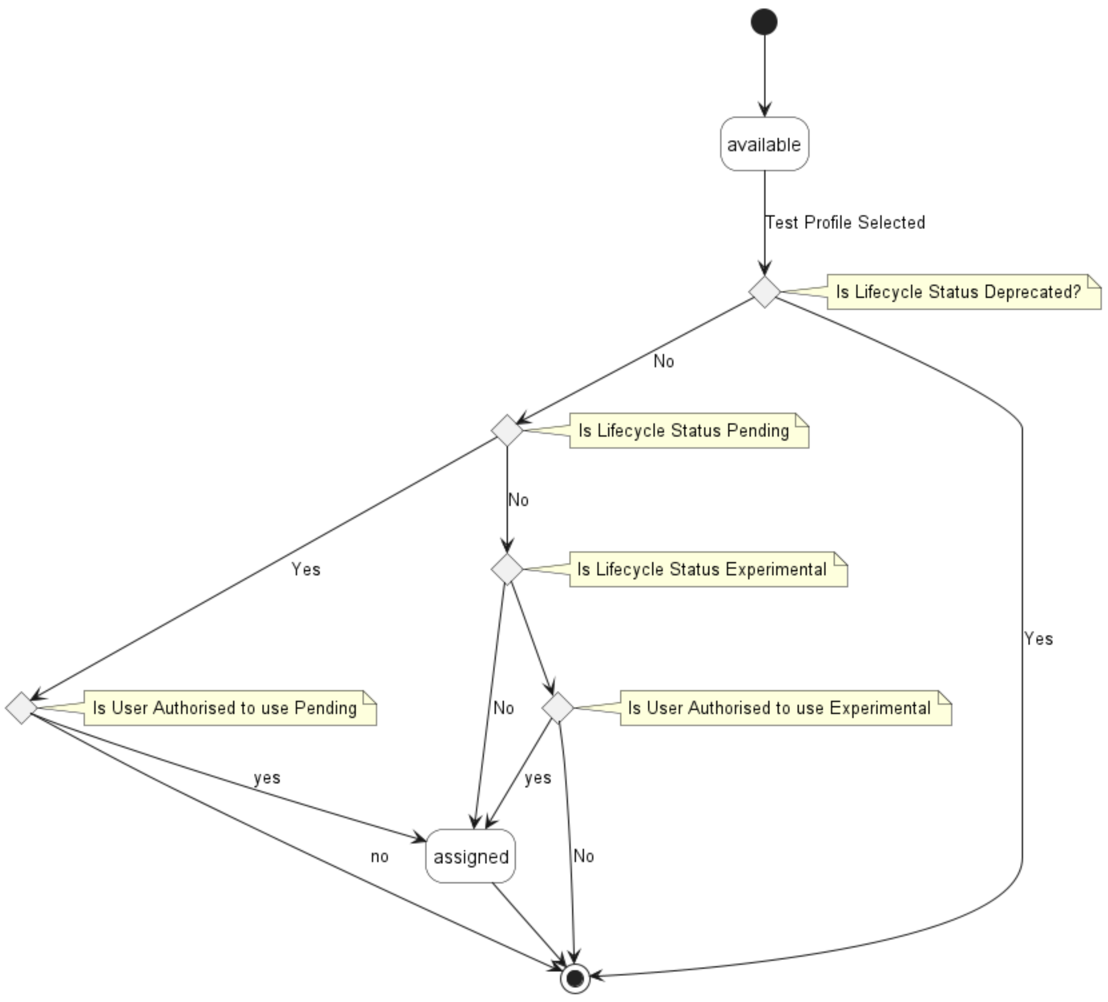
[R9] The Seller/Server **MUST** specify the following attributes in a response:

- `creationDate`
- `id`

[R10] The `id` **MUST** remain the same value for the life of the Test Profile.

6.1.4. Test Profile Lifecycle Flow

Figure 14 presents the Test Profile Lifecycle Flow



available
Test Profile Selected
Is Lifecycle Status Deprecated?
No
Is Lifecycle Status Pending
No
Is Lifecycle Status Experimental
Yes
Yes
Is User Authorised to use Pending
No
Is User Authorised to use Experimental
yes
yes
no
assigned
No

Figure 14. Test Profile Lifecycle Status Flow

A Test Profile begins in the `available` state once it has been created or modified and is ready to be referenced in a Test Job. When the profile is selected for use in a Test Job, its lifecycle state transitions to `assigned`. While in the `assigned` state, the Test Profile is considered active and can no longer be modified.

Table 8 presents the mapping between the `TestProfile` API `lifecycleState` names and the Mplify 136.1 naming, together with the state description.

State	Mplify 136.1 name	Description
`assigned`	ASSIGNED	The Test Profile has been assigned to a Test Job.

State	Mplify 136.1 name	Description
`available`	AVAILABLE	The Test Profile has been created or modified and is ready for users to specify in a Test Job.

Table 8. Test Profile Lifecycle states

Test Profiles include a Lifecycle Status attribute that indicates the stage of the profile within the development and approval process. The status can range from `experimental`, where usage may be limited to a small group of users, to `deprecated`, indicating the profile has been replaced and is no longer intended for use. Other possible statuses include `pending`, meaning the profile is awaiting approval, and `approved`, where the profile has been reviewed and is available for general use. The Lifecycle Status also helps determine which types of users are permitted to use the Test Profile.

Table 9 presents the mapping between the API `lifecycleStatus` names and the Mplify 136.1 naming, together with the states description.

Status	Mplify 136.1 name	Description
`experimental`	EXPERIMENTAL	Test Profile use may be limited to a small number of users.
`pending`	PENDING	Test Profile is waiting to be Approved.
`approved`	APPROVED	Test Profile has been Approved for general use.
`deprecated`	DEPRECATED	Test Profile has been replaced by another Test Profile.

Table 9. Test Profile Lifecycle statuses

6.2. Use Case 2: Retrieve List of Test Profiles

The Buyer/Client can retrieve a list of `TestProfile` by using a `GET /testProfile` operation with desired filtering criteria.

[O5] The Buyer/Client Retrieve List of Test Profiles request **MAY** contain none or more of the following attributes as filter criteria:

- `description`
- `creationDate.gt`
- `creationDate.lt`
- `lastUpdate.gt`
- `lastUpdate.lt`
- `relatedServiceSpecificationId`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testProfile?creationDate.gt="2024-08-
12T23:20:50.52Z"&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Test Profile objects created after `2024-08-12T23:20:50.52Z`. Additionally, the Buyer/Client asks only for a first (`offset=0`) pack of 10 results (`limit=10`) to be returned. The correct response (HTTP code `200`) in the response body contains a list of `TestProfile` objects matching the criteria. To get all the details, the Buyer/Client has to query a specific `TestProfile` by its `id`. Details related to pagination are described in section 6.2.1

[R11] If the request is successful, the Seller/Server MUST reply with list of `TestProfile` objects that match filter criteria to the Buyer/Client. [Mplify 136.1 R16]

[R12] If the request is successful but the Seller/Server finds no entries that match the filter criteria, they **MUST** return an empty list. [Mplify 136.1 R17]

[R13] If the request is unsuccessful, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R19]

6.2.1. Response pagination

A response to retrieve a list of results (e.g. `GET /testJob`) can be paginated. The Buyer/Client can specify the following query attributes related to pagination:

- `limit` - number of expected list items
- `offset` - offset of the first element in the result list

The filtering and pagination attributes must be specified in URI query format RFC3986.The Seller/Server returns a list of elements that comply with the requested `limit`. If the requested `limit` is higher than the supported list size the smaller list result is returned. In that case, the size of the result is returned in the header attribute `X-Result-Count`. The Seller can indicate that there are additional results available using:

- `X-Total-Count` header attribute with the total number of available results
- `X-Pagination-Throttled` header set to `true`

[R14] Seller **MUST** use either `X-Total-Count` or `X-Pagination-Throttled` to indicate that the page was truncated and additional results are available.

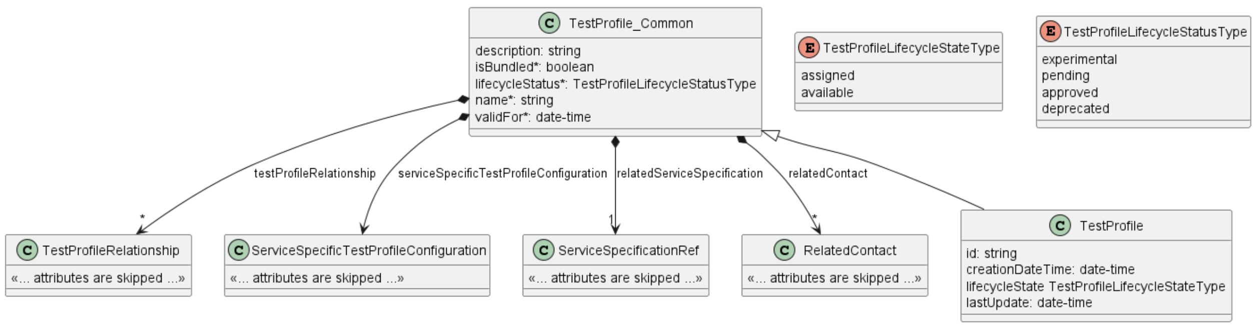
6.3. Use Case 3: Retrieve Test Profile by Profile Identifier

The Buyer/Client can retrieve single `TestProfile` instance from the Seller/Server by using a `GET /testProfile/{id}` operation. The payload returned in the response is a full representation of the Test Profile and includes all attributes the Buyer/Client has provided while sending a Test Profile create request, together with additional attributes set by Seller/Server. A response to a Get by Id for a `TestProfile` with `id=8df0981a-0949-11ee-be56-0242ac120002` would return exactly the same response as presented in section 6.1.3.

[R15] If the request is successful, the Seller/Server response to a "Retrieve Test Profile by Test Profile Identifier" request **MUST** include a `TestProfile`. [Mplify 136.1 R24]

[R16] If the request is unsuccessful, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R25]

[R17] In case `id` does not allow finding a `TestProfile` in Seller/Server's system, an error response `Error404` **MUST** be returned.



TestProfile_Common
description: string
isBundled*: boolean
lifecycleStatus*: TestProfileLifecycleStatusType
name*: string
validFor*: date-time
TestProfileLifecycleStateType
assigned
available
TestProfileLifecycleStatusType
experimental
pending
approved
deprecated
testProfileRelationship
serviceSpecificTestProfileConfiguration
relatedServiceSpecification
relatedContact
*
1
*
TestProfileRelationship
«... attributes are skipped ...»
ServiceSpecificTestProfileConfiguration
«... attributes are skipped ...»
ServiceSpecificationRef
«... attributes are skipped ...»
RelatedContact
«... attributes are skipped ...»
TestProfile
id: string
creationDateTime: date-time
lifecycleState TestProfileLifecycleStateType
lastUpdate: date-time

Figure 15. Use Case 3: Retrieve Test Profile by Profile Identifier - Model

6.4. Use Case 4: Modify Test Profile

The update operation is performed using the REST PATCH method at the endpoint `PATCH /testProfile/{id}`. A specialized type, `TestProfile_Modify`, is provided for this purpose. It includes only the attributes that are updatable and can be set by the Buyer/Client. A Test Profile cannot be modified if it is used by a Test Job in which case its `lifecycleState` is set to `assigned`.

The PATCH usage recommendation follows RFC 7386 json/merge (https://tools.ietf.org/html/rfc7386).

Figure 16 presents the model used in the PATCH request. The Seller/Server responds with a `TestProfile` type which is a full representation of Test Profile instance.

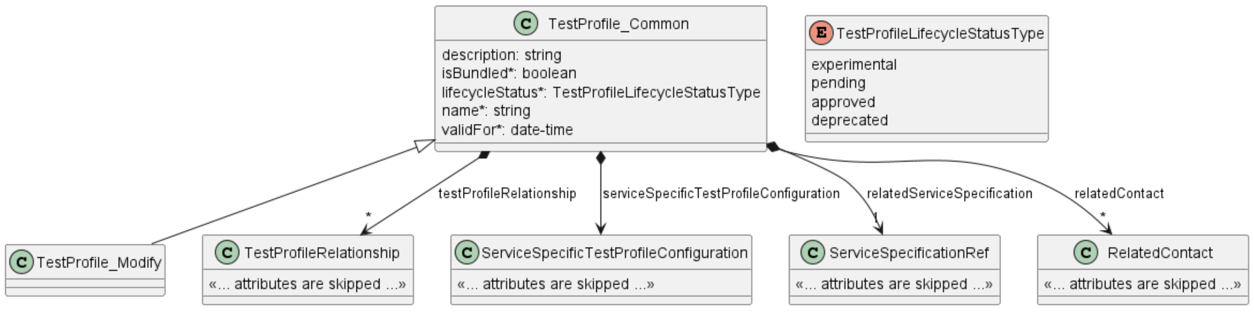


Figure 16. Patch request Model

[R18] The Buyer's Modify Test Profile request **MUST** include Test Profile Identifier and at least one other attribute from `TestProfile_Modify` object. [Mplify 136.1 R8]

- `description`
- `isBundled`
- `lifecycleStatus`
- `name`
- `testProfileRelationship`
- `serviceSpecificTestProfileConfiguration`
- `relatedServiceSpecification`
- `relatedContact`

[O6] The Buyer's Modify Test Profile request **MAY** include any other attributes from `TestProfile_Modify` object. [Mplify 136.1 O2]

[R19] If the request is successful, the Seller/Server response to a "Retrieve Test Profile by Test Profile Identifier" request **MUST** include a `TestProfile` with requested attributes updated. [Mplify 136.1 R9]

[R20] The Seller/Server **MUST** set `lastUpdate` to current date and time. [Mplify 136.1 R11]

[R21] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R12]

[R22] In case `id` does not allow to find a `TestProfile` that is to be updated in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R23] The Seller/Server **MUST** return an **Error422** if the Test Profile `TestProfileLifecycleState` is set to `assigned`

The example below shows a request to patch a `TestProfile` that was created in section 6.1.2.

The request below aims to:

- update Test Profile `description`
- set last date that the Test Profile is valid by modifying the `validFor`
- change Test Profile `lifecycleStatus` to `approved`

```
{
  "description": "Approved Basic IP Ping Test Profile",
  "validFor": "2026-01-31T23:59:59Z",
  "lifecycleStatus": "approved"
}
```

6.5. Use Case 5: Delete Test Profile

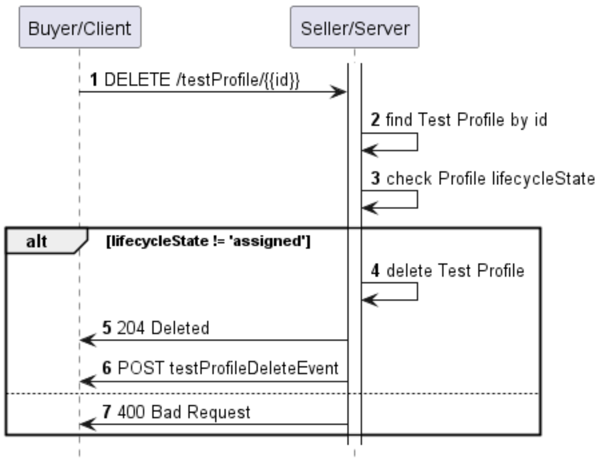
The Buyer/Client may request to delete a Test Profile by using `DELETE /testProfile/{id}` endpoint. This operation only requires providing the `id` in the path and has an empty `204` confirmation response.

[R24] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R15]

[R25] In case `id` does not allow to find a `TestProfile` that is to be deleted in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R26] The Seller/Server **MUST** return an error response `Error422` if the `TestProfile`, `lifecycleState` attribute is `assigned`.

The sequence diagram below presents this use case in detail.



Buyer/Client
Seller/Server
1 DELETE /testProfile/{{id}}
2 find Test Profile by id
3 check Profile lifecycleState
alt
[lifecycleState != 'assigned']
4 delete Test Profile
5 204 Deleted
6 POST testProfileDeleteEvent
7 400 Bad Request

Figure 17. Delete Test Profile Flow

The Seller/Server verifies the request, then searches for a Test Profile to be deleted by the given `id`. If found, the Seller/Server checks also if there are any Test Job objects that refer to the Test Profile (meaning `lifecycleState` is `assigned`). If everything is verified correctly, the Seller deletes the Test Profile, sends a successful response to a request followed by `testProfileDeleteEvent` in case the Buyer/Client subscribed for relevant notifications.

6.6. Use Case 6: Create a Test Job

A Test Job is a service-specific entity that defines both the service under test and the test profile to be used. It is responsible for performing the actual test and making the results available. As the

Test Job runs, it follows the instructions in the referenced test profile to execute the specified test. Each Test Job is expected to produce a Test Result, which provides the Buyer/Client with the outcome of the test.

For example, a Test Job can be created to execute a test on an IP service. The Test Profile such as one defining how to perform an ICMP ping test is referenced within the Test Job. When the Test Job runs, it follows the steps defined in the Test Profile to test the service. Once the test is complete, the results are made available and can be retrieved by the user.

Test Jobs may also be created without referencing a Test Profile; these are known as Test Jobs without a Test Profile. This approach is typically used for ad hoc or one-off testing rather than for repeatable, standardized scenarios. In such cases, the Test Job itself defines the configuration and execution steps that would otherwise be specified in the Test Profile.

[O7] Test Job **MAY** use Test Profile as a template.

6.6.1. Interaction flow

The flow of this use case is shown in Figure 18.

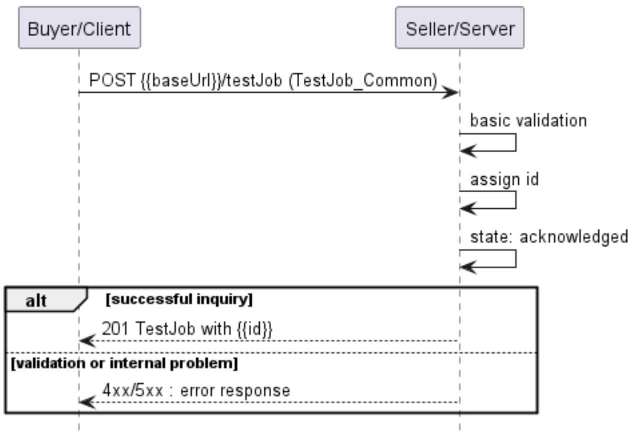


Figure 18. Use Case 6 - Test Job create request flow

The Buyer/Client sends a request with a `TestJob_Common` type in the body. The Seller/Server performs request validation, assigns an `id`, and returns the `TestJob` type in the response body, with a `state` set to `acknowledged`. From this point, the Test Job is ready for further processing. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `TestJob`. The two patterns are presented in the following diagrams.

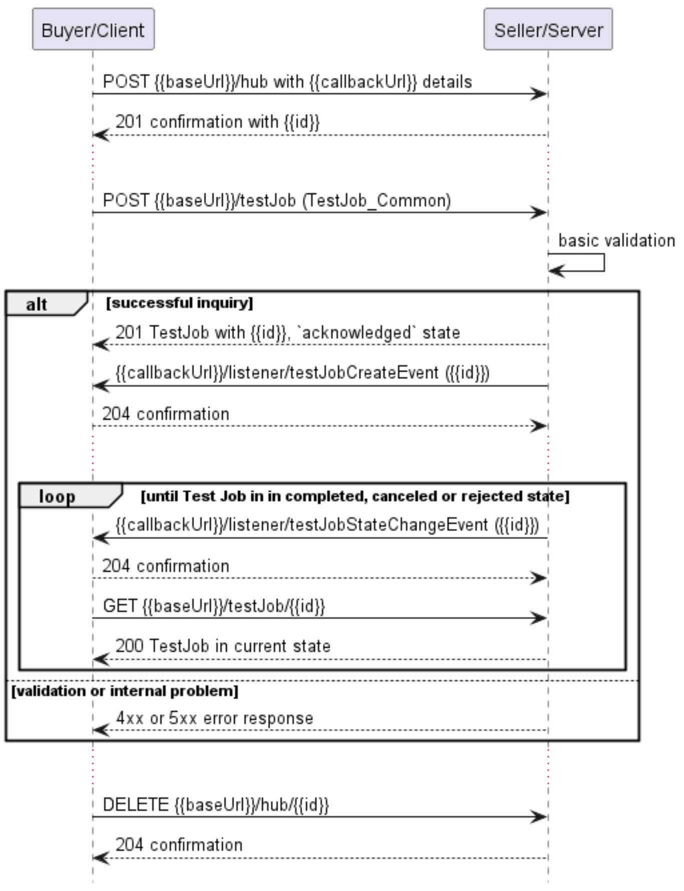

Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/testJob (TestJob_Common)
basic validation
alt
[successful inquiry]
201 TestJob with {{id}}, `acknowledged` state
{{callbackUrl}}/listener/testJobCreateEvent ({{id}})
204 confirmation
loop
[until Test Job in in completed, canceled or rejected state]
{{callbackUrl}}/listener/testJobStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/testJob/{{id}}
200 TestJob in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 19. Test Job progress tracking - Notifications

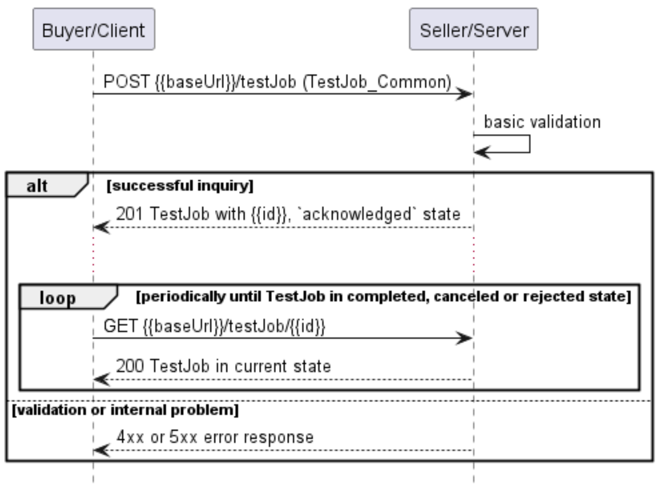

Buyer/Client
Seller/Server
POST {{baseUrl}}/testJob (TestJob_Common)
basic validation
alt
[successful inquiry]
201 TestJob with {{id}}, `acknowledged` state
loop
[periodically until TestJob in completed, canceled or rejected state]
GET {{baseUrl}}/testJob/{{id}}
200 TestJob in current state
[validation or internal problem]
4xx or 5xx error response

Figure 20. Test Job progress tracking - Polling

6.6.2. Create Test Job Request with Test Profile

Figure 20 presents the most important part of the data model used during the Create Test Job request (`POST /testJob`) and response. The model of the request message - `TestJob_Common` contains only attributes that can (or must) be set by the Buyer/Client. The Seller/Server (SOF) then enriches the entity in the response with additional information.

A `TestJob_Common` defines service test configuration parameters that are to be applied at execution time. It also refers to the existing `TestProfile` by its `id` or directly provides values of attributes defined by the `TestProfile` type. See chapter section 6.6.5 for more details.

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

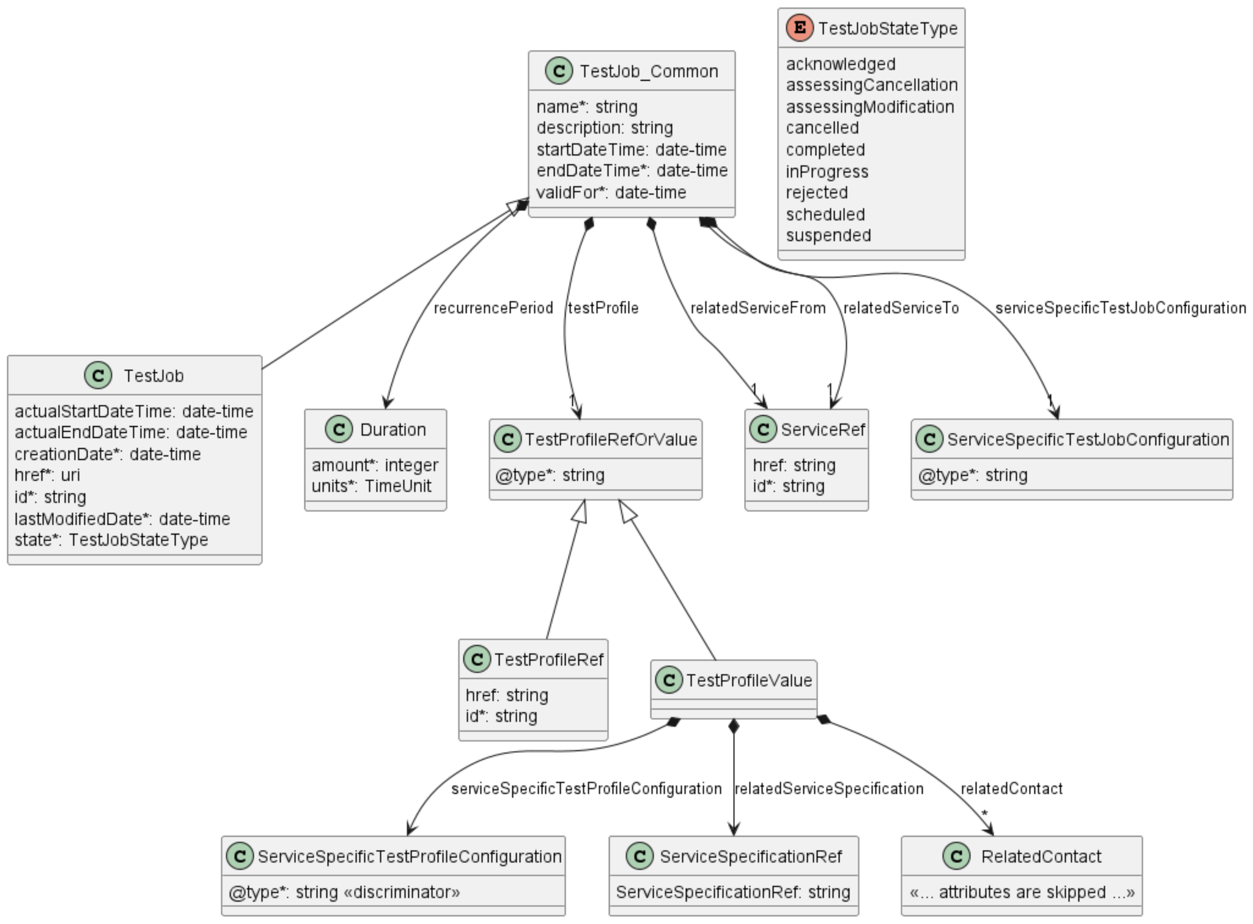


Figure 21. Test Job with Test Profile Key Entities

To send a create Test Job request the Buyer/Client uses the `createTestJob` operation from the API: `POST /testJob`. For clarity, some of the create Test Job payload's attributes might be omitted to improve examples' readability.

Test Job Create Request

```
{
  "name": "PingTestJob-001",
  "description": "Ping test from ServiceA to ServiceB",
  "relatedServiceFrom": {
    "id": "svc-001"
  },
  "relatedServiceTo": {
    "id": "svc-002"
  },
  "testProfile": {
    "@type": "TestProfileRef",
    "id": "tp-001"
  },
  "requestedEndDateTime": "2025-06-30T23:59:59Z",
  "requestedStartDateTime": "2025-06-29T23:59:59Z",
  "serviceSpecificTestJobConfiguration": {
    "@type": "urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all",
    "interface": {
      "name": "location-1",
      "description": "Primary test location",
      "ipvcEndpoint": ["ep-01"]
    },
    "vlan": 100,
    "sourceIpAddress": {
      "ipv4": ["192.0.2.1"]
    },
    "destinationIpAddress": {
      "ipv4": ["192.0.2.2"]
    },
    "transmissionInterval": {
      "amount": 1,
      "units": "seconds"
    },
    "protocol": "ICMP",
    "count": 5,
    "packetSize": 64,
    "timeout": 3
  }
}
```

[R27] The Buyer's/Client's Create Test Job **MUST** provide the following attributes: [Mplify 136.1 R26]

- `name`
- `requestedStartDateTime`
- `requestedEndDateTime`
- `testProfile`
- `relatedServiceFrom`
- `relatedServiceTo`
- `serviceSpecificTestJobConfiguration`

[R28] If the Test Job's `validFor` date/time is reached while it is in the `inProgress`, `suspended`, or `assessingModification` state, the Seller/Server **MUST** complete the currently running Test Job. [Mplify 136.1 R25]

[R29] If the Test Job's `validFor` date/time is reached while a Test Job is scheduled, the Seller/Server **MUST** cancel the Test Job. [Mplify 136.1 R26]

6.6.3. Create Test Job with Test Profile Response

Entities used for providing a response to Create Test Job requests are presented in Figure 21. The Seller/Server responds with a `TestJob` type, which adds some attributes (like `id` or `state`) to the `TestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

Test Job Create Response

```
  {
    "id": "job-12345",
    "href": "/testJobs/job-12345",
    "name": "PingTestJob-001",
    "description": "Ping test from ServiceA to ServiceB",
    "relatedServiceFrom": {
      "id": "svc-001"
    },
    "relatedServiceTo": {
      "id": "svc-002"
    },
    "testProfile": {
      "@type": "TestProfileRef",
      "id": "tp-001"
    },
    "requestedEndDateTime": "2025-06-30T23:59:59Z",
    "requestedStartDateTime": "2025-06-29T23:59:59Z",
    "serviceSpecificTestJobConfiguration": {
      "@type": "urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all",
      "interface": {
        "name": "location-1",
        "description": "Primary test location",
        "ipvcEndpoint": ["ep-01"]
      },
      "vlan": 100,
      "sourceIpAddress": {
        "ipv4": ["192.0.2.1"]
      },
      "destinationIpAddress": {
        "ipv4": ["192.0.2.2"]
      },
      "transmissionInterval": {
        "amount": 1,
        "units": "seconds"
      },
      "protocol": "ICMP",
      "count": 5,
      "packetSize": 64,
      "timeout": 3
    },
    "creationDate": "2025-06-13T10:00:00Z",
    "lastModifiedDate": "2025-06-13T10:00:00Z",
    "state": "acknowledged"
  }
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R30] If the request is successful, the Seller's response to a Create Test Job request **MUST** echo back all Buyer/Client provided attributes. [Mplify 136.1 R29]

[R31] If the request is successful, the Seller MUST return the following attributes:

- `id`
- `state` [Mplify 136.1 R30]

[R32] If the request is unsuccessful, the Seller/Server **MUST** return an error with explanation to the Buyer/Client.. [Mplify 136.1 R31, R32]

[R33] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R33]

6.6.4. Create Test Job without Test Profile Request

A Test Job can be created without referencing an existing Test Profile in the request by directly providing the required attributes typically defined by the `TestProfile`.

The `TestJob_Common` class, used as a payload for the `createTestJob` operation includes the `testProfile` attribute, which is of type `TestProfileRefOrValue`. By specifying the value of the `@type` attribute (discriminator) to `@type=TestProfileValue` it is possible to directly provide TestProfile attributes within the Test Job request.

Figure 22 illustrates the key part of the data model that can be used during the creation of a Test Job to directly provide the required attributes typically defined by the `TestProfile` type in the request (`POST /testJob`).

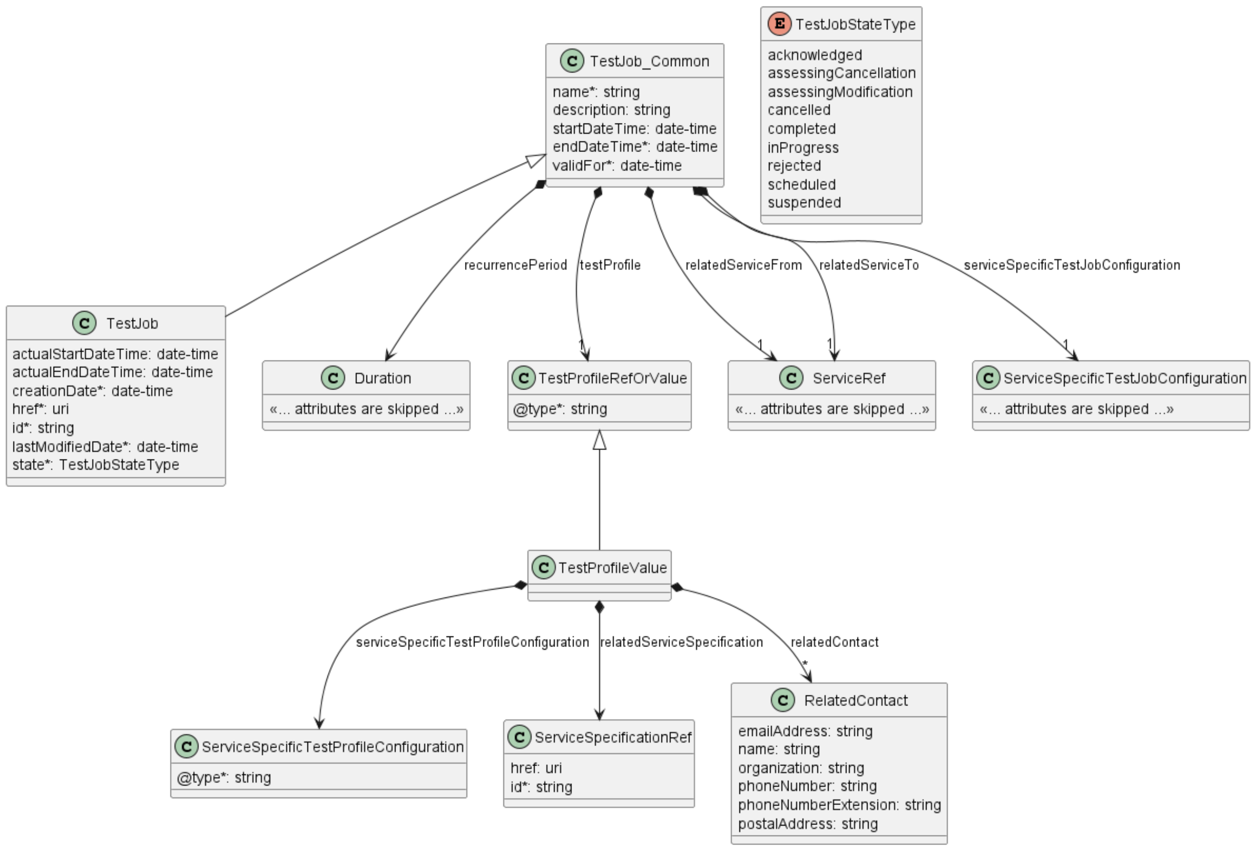


Figure 22. Test Job without Test Profile Key Entities

To send a create Test Job without Test Profile request the Buyer/Client uses the `createTestJob` operation from the API: `POST /testJob`. For clarity, some of the create Test Job payload's attributes might be omitted to improve examples' readability.

Test Job Create Request

```
{
  "name": "PingTestJob-002",
  "description": "Ping test from ServiceA to ServiceB",
  "testProfile": {
    "@type": "TestProfileValue",
    "relatedServiceSpecification": {
      "id": "svc-spec-001",
      "href": "https://serverRoot/mefApi/legato/serviceSpecifications/svc-spec-001"
    },
    "relatedContact": [
      {
        "name": "Alice Johnson",
        "organization": "ExampleCorp",
        "emailAddress": "alice.j@example.com",
        "phoneNumber": "+1-555-0100",
        "postalAddress": "123 Network Lane, NetCity, NC 12345"
      }
    ],
    "serviceSpecificTestProfileConfiguration": {
      "@type": "urn:mef:lso:spec:legato:ping-report:v0.0.1:all",
      "vlan": 100,
      "protocol": "IPV4",
      "interface": {
        "name": "Site-A",
        "description": "Test endpoint at Site-A",
        "cloudService": false,
        "ipvcEndpoint": ["ep-001"]
      }
    }
  },
  "requestedEndDateTime": "2025-06-30T23:59:59Z",
  "requestedStartDateTime": "2025-06-29T23:59:59Z",
  "serviceSpecificTestJobConfiguration": {
    "@type": "urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all",
    "interface": {
      "name": "location-1",
      "description": "Primary test location",
      "ipvcEndpoint": ["ep-01"]
    },
    "vlan": 100,
    "sourceIpAddress": {
      "ipv4": ["192.0.2.1"]
    },
    "destinationIpAddress": {
      "ipv4": ["192.0.2.2"]
    },
    "transmissionInterval": {
      "amount": 1,
      "units": "seconds"
    },
    "protocol": "ICMP",
    "count": 5,
    "packetSize": 64,
    "timeout": 3
  },
  "relatedServiceFrom": {
    "id": "service-from-001",
    "href": "https://serverRoot/mefApi/legato/services/service-from-001"
  },
  "relatedServiceTo": {
    "id": "service-to-002",
    "href": "https://serverRoot/mefApi/legato/services/service-to-002"
  },
  "scheduleTime": "2025-06-12T07:55:00Z"
}
```

[R34] The Buyer's/Client's Create Test Job request **MUST** support the following attributes:

- `name`
- `requestedStartDateTime`
- `requestedEndDateTime`
- `relatedServiceFrom`
- `relatedServiceTo`
- `serviceSpecificTestJobConfiguration`
- `serviceSpecificTestProfileConfiguration`
- `relatedServiceSpecification`
- `relatedContact`

where `serviceSpecificTestProfileConfiguration`, `relatedServiceSpecification` and `relatedContact` are Test Profile related attributes. [Mplify 136.1 R34]

6.6.5. Create Test Job without Test Profile Response

Entities used for providing a response to Create Test Job requests are presented in Figure 22. The Seller/Server responds with a `TestJob` type, which adds some attributes (like `id` or `state`) to the `TestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

Test Job Create Response

```
  {
    "id": "job-6789",
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-6789",
    "name": "PingTestJob-002",
    "description": "Ping test from ServiceA to ServiceB",
    "testProfile": {
      "@type": "TestProfileValue",
      "relatedServiceSpecification": {
        "id": "svc-spec-001",
        "href": "https://serverRoot/mefApi/legato/serviceSpecifications/svc-spec-001"
      },
      "relatedContact": [
        {
          "name": "Alice Johnson",
          "organization": "ExampleCorp",
          "emailAddress": "alice.j@example.com",
          "phoneNumber": "+1-555-0100",
          "postalAddress": "123 Network Lane, NetCity, NC 12345"
        }
      ],
      "serviceSpecificTestProfileConfiguration": {
        "@type": "urn:mef:lso:spec:legato:ping-report:v0.0.1:all",
        "vlan": 100,
        "protocol": "IPV4",
        "interface": {
          "name": "Site-A",
          "description": "Test endpoint at Site-A",
          "cloudService": false,
          "ipvcEndpoint": ["ep-001"]
        }
      }
    },
    "requestedEndDateTime": "2025-06-30T23:59:59Z",
    "requestedStartDateTime": "2025-06-29T23:59:59Z",
    "serviceSpecificTestJobConfiguration": {
      "@type": "urn:mef:lso:spec:legato:ping-configuration:v0.0.1:all",
      "interface": {
        "name": "location-1",
        "description": "Primary test location",
        "ipvcEndpoint": ["ep-01"]
      },
      "vlan": 100,
      "sourceIpAddress": {
        "ipv4": ["192.0.2.1"]
      },
      "destinationIpAddress": {
        "ipv4": ["192.0.2.2"]
      },
      "transmissionInterval": {
        "amount": 1,
        "units": "seconds"
      },
      "protocol": "ICMP",
      "count": 5,
      "packetSize": 64,
      "timeout": 3
    },
    "relatedServiceFrom": {
      "id": "service-from-001",
      "href": "https://serverRoot/mefApi/legato/services/service-from-001"
    },
    "relatedServiceTo": {
      "id": "service-to-002",
      "href": "https://serverRoot/mefApi/legato/services/service-to-002"
    },
    "scheduleTime": "2025-06-12T07:55:00Z",
    "status": "scheduled"
  }
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R35] If the request is successful, the Seller's response to a Create Test Job request **MUST** echo back all Buyer/Client provided attributes. [Mplify 136.1 R33]

[R36] If the request is successful, the Seller **MUST** return the following attributes:

- `id`
- `state` [Mplify 136.1 R34]

[R37] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R37]

6.6.6. Test Job State Machine

Figure 23 presents the Test Job state machine:

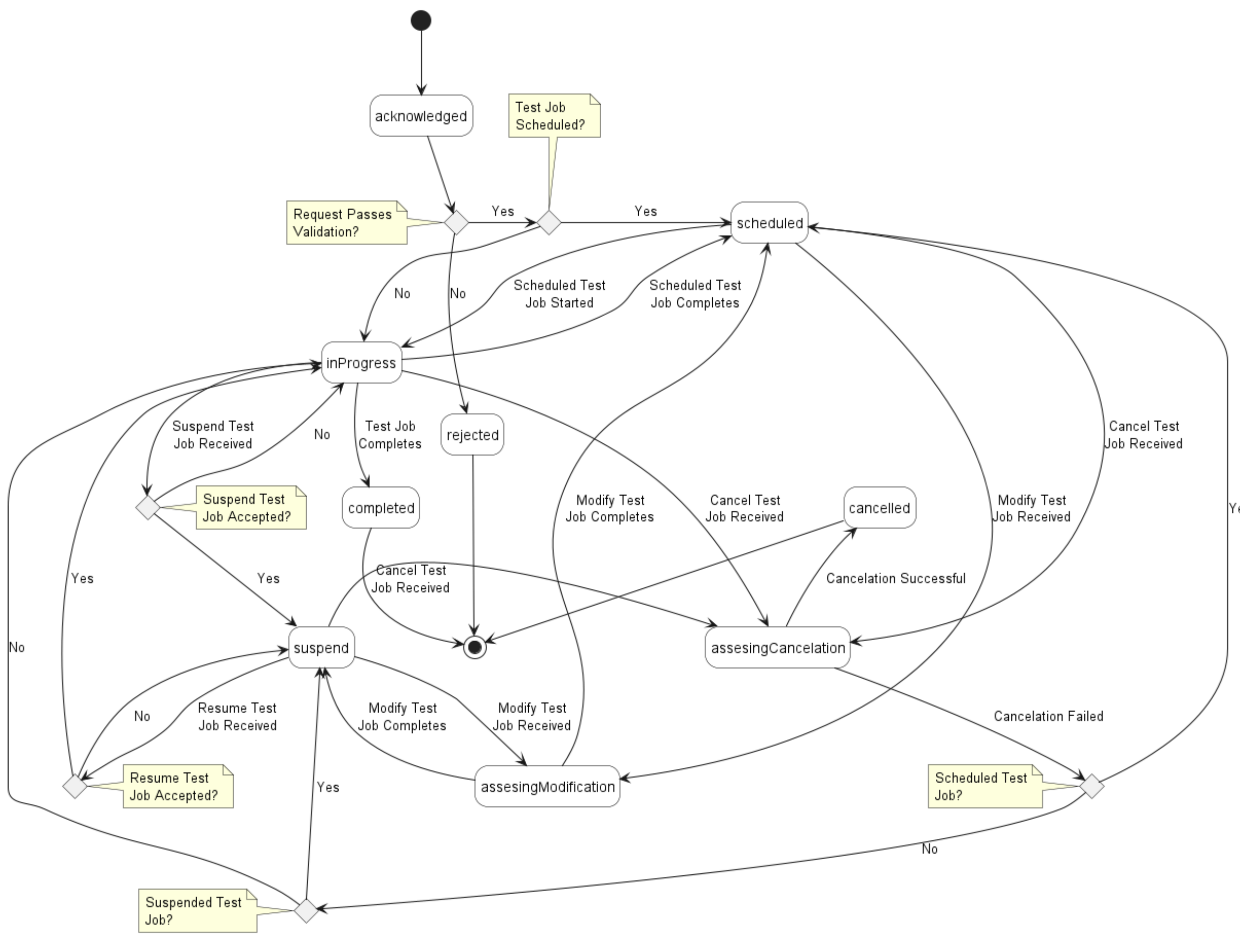


Figure 23. Test Job State Machine

After receiving the request, the Seller/Server (SOF) performs basic checks of the message. If any problem is found an Error response is provided. If the validation passes a response is provided with `TestJob` in `acknowledged` state. Next, the Seller/Server performs all the remaining business and time-consuming validations. At this point, an Error response cannot be provided anymore, so the profile moves to a `rejected` state if some issues are found. `TestJob` moves to either the `scheduled` or `inProgress` state depending on the assigned schedule. `TestJob` remains `scheduled` state until the scheduled start time is reached. After completion, the Seller/Server verifies if `TestJob` is recurring. If yes, `TestJob` moves to either `scheduled` or `inProgress` state depending on the schedule definition. Otherwise, it moves to a `completed` state. `TestJob` can be cancelled when in `scheduled`, `suspended` or `inProgress`. When cancellation is successful, `TestJob` moves to `cancelled` state. `TestJob` can be modified only in the `scheduled` or `suspended` state.

Table 10 presents the mapping between the API `state` names and the Mplify 136.1 naming, together with the states' description.

state	Mplify 136.1 name	Description

state	Mplify 136.1 name	Description
`acknowledged`	ACKNOWLEDGED	The Create Test Job request has been received from the Buyer/Client and the Seller/Server has assigned a Test Job Identifier to it. If the request attributes fail validation, the Create Test Job moves to the `rejected` state. If the attributes pass validation, it is then determined if the Create Test Job Start Date Time is immediate or if the Create Test Job Start Date Time indicates that the Test Job is to be scheduled for a later date time. If the Test Job is to be scheduled the Test Job moves to the `scheduled` state and awaits the scheduled date and time. If the Test Job is to be performed immediately, the Test Job moves to the `inProgress` state and Test Results begin.
`assessingCancellation`	ASSESSING_CANCELLATION	A Cancel Test Job request is received while the Test Job is in the `inProgress`, `suspend` or `scheduled` state. If the Cancel Test Job request is approved, the Test Job moves to the `cancelled` state. If not, the Test Job returns to the `inProgress`, `suspend` or `scheduled` state.
`assessingModification`	ASSESSING_MODIFICATION	A Modify Test Job request while the Test Job is in the `suspend` or `scheduled` state. If the Modify Test Job is accepted, the Test Job is updated. If the Modify Test Job is declined, the Test Job is not updated and returns to the `suspend` or `scheduled` state.
`cancelled`	CANCELLED	A Cancel Test Job request is received from the Buyer/Client. If the request is accepted, the Test Job moves to the `cancelled` state. The Test Job must be in the `inProgress`, `scheduled`, or `suspend`, state.
`completed`	COMPLETED	The Test Job has reached the End Date Time or has completed all Test Measurements and provided Test Results.

state	Mplify 136.1 name	Description
`inProgress`	IN_PROGRESS	Whether an immediate request or a scheduled request, the Test Job moves to the `inProgress` state when it begins performing Test Results. If a Cancel Test Job request is received and accepted, the Test Job moves to the `cancelled` state. If the Cancel Test Job request is declined, the Test Job returns to the `inProgress` state and continues Test Results until they are completed. If a Suspend Test Job request is received, the Test Job moves to the `suspend` state.
`rejected`	REJECTED	The Create Test Job request fails validation and is rejected.
`scheduled`	SCHEDULED	The Test Job is scheduled to start at a later time. The Test Job stays in the `scheduled` state until the Start Date and Time is reached. The Test Job moves to `inProgress` when the Start Date and Time is reached. A Test Job with the state `scheduled` can be moved to the `suspend` or `cancelled` state.
`suspend`	SUSPEND	A Test Job in the `inProgress` or `scheduled` state receives a Suspend Test Job request. The Test Job moves to the `suspend` state.

Table 10. Test Job State Machine states

[R38] The Seller/Server **MUST** support all Test Job states and their associated transitions as described in Figure 20 and Table 10.

6.7. Use Case 7: Retrieve List of Test Jobs

The Buyer/Client can retrieve a list of `TestJob_Find` by using a `GET /testJob` operation with desired filtering criteria.

[R39] The Buyer/Client's Retrieve Test Job List request **MUST** contain none or more of the following filter criteria:

- `relatedServiceIdFrom`
- `relatedServiceIdTo`
- `testProfileId`
- `name`
- `requestedStartDateTime.gt`
- `requestedStartDateTime.lt`

- `requestedEndDateTime.gt`
- `requestedEndDateTime.lt`

[Mplify 136.1 R738]

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob?relatedServiceIdFrom=service-from-
001&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Test Job objects that have `relatedServiceIdFrom` equal `service-from-001`. The correct response (HTTP code `200`) in the response body contains a list of `TestJob_Find` objects matching the criteria. To get all the details, the Buyer/Client has to query a specific `TestJob` by its `id`. Details related to pagination are described in section 6.2.1

[R40] If successful, the Seller/Server **MUST** return a list `TestJob_Find` objects that match the selected filter criteria. [Mplify 136.1 R79]

[R41] If successful but no matches to the filter criteria are found, the Seller/Server **MUST** return an empty list [Mplify 136.1 R80]

[R42] If errors are encountered, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R81, R82]

Figure 24 presents entities related to the use case.

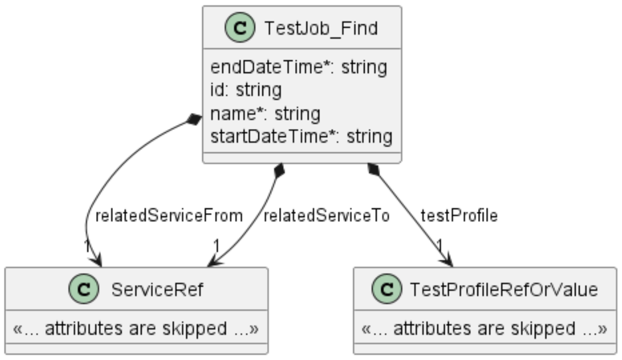


Figure 24. Use Case 7: Retrieve Test Job List - Model

6.8. Use Case 8: Retrieve Test Job by Job Identifier

The Buyer/Client can get detailed information about the Test Job from the Seller/Server by using a `GET /testJob/{id}` operation. The payload returned in the response is a full representation of the Test Job and includes all attributes the Buyer/Client has provided while sending a Test Job create request, together with additional attributes set by Seller/Server.

Get List and Get by Identifier operations return different representations of Test Job. Get List returns the `TestJob_Find` object. A response to a Get by ID for a `TestJob` with `id=7cf0981a-0949-11ee-be56-0242ac121234` would return exactly the same response as presented in section 6.6.3.

[R43] The Buyer/Client’s Retrieve Test Job by Identifier request **MUST** include the Test Job Identifier and only the Test Job Identifier. [Mplify 136.1 R83]

[R44] If successful, the Seller/Server **MUST** include all `TestJob` attributes in their response. [Mplify 136.1 R84]

[R45] If errors are encountered, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R85, R86]

[R46] In case `id` does not allow finding a `TestJob` in Seller/Server's system, an error response `Error404` **MUST** be returned.

6.9. Use Case 9: Modify Test Job

Due to the need for provisioning and resource reservation on the Seller/Server side, the modification operation associated with Test Job may exhibit prolonged duration. Consequently, this operation is implemented through a separate lifecycle process.

6.9.1. Interaction flow

The flow of this use case is shown in Figure 25.

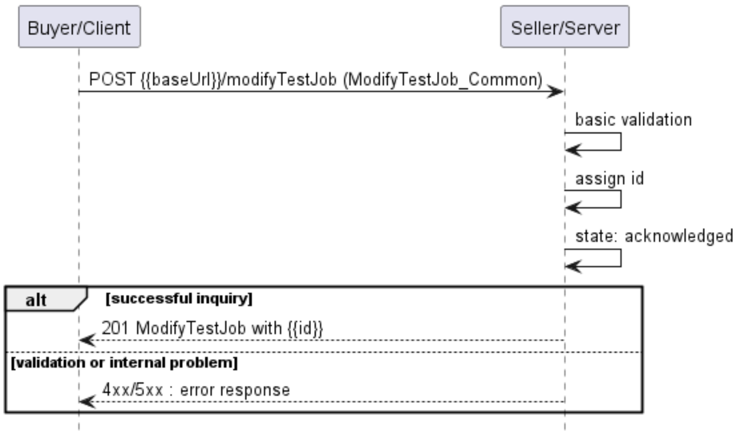
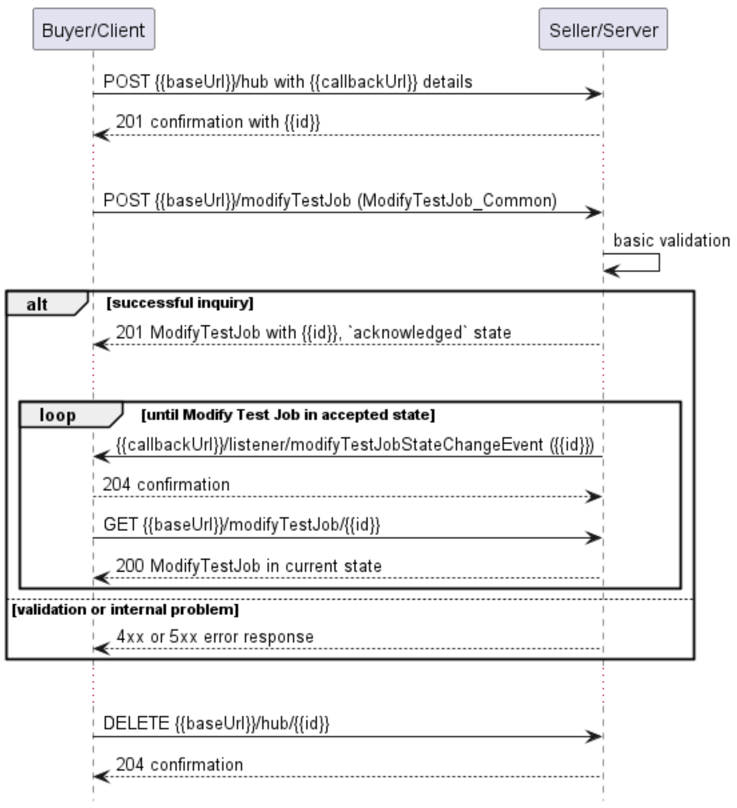


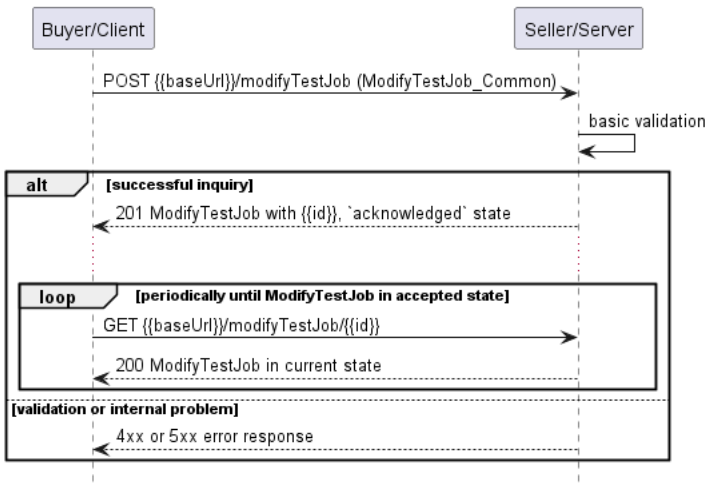
Figure 25. Use Case 9 - Modify Test Job create request flow

The Buyer/Client sends a request with a `ModifyTestJob_Common` type in the body. The Seller/Server performs request validation, assigns an `id`, and returns `ModifyTestJob` type in the response body, with a `state` set to `acknowledged`. Further processing is performed by Seller/Server which will in case of success update Test Job. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `ModifyTestJob`. The two patterns are presented in the following diagrams.



Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/modifyTestJob (ModifyTestJob_Common)
basic validation
alt
[successful inquiry]
201 ModifyTestJob with {{id}}, `acknowledged` state
loop
[until Modify Test Job in accepted state]
{{callbackUrl}}/listener/modifyTestJobStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/modifyTestJob/{{id}}
200 ModifyTestJob in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 26. Modify Test Job progress tracking - Notifications



Buyer/Client
Seller/Server
POST {{baseUrl}}/modifyTestJob (ModifyTestJob_Common)
basic validation
alt
[successful inquiry]
201 ModifyTestJob with {{id}}, `acknowledged` state
loop
[periodically until ModifyTestJob in accepted state]
GET {{baseUrl}}/modifyTestJob/{{id}}
200 ModifyTestJob in current state
[validation or internal problem]
4xx or 5xx error response

Figure 27. Modify Test Job progress tracking - Polling

6.9.2. Modify Test Job Request

Figure 28 presents the most important part of the data model used during the Modify Test Job request `POST /modifyTestJob` and response. The model of the request message `ModifyTestJob_Common` contains only attributes that can (or must) be set by the Buyer/Client. The Seller/Server then enriches the entity in the response with additional information.

Buyer/Client is only allowed to modify Test Jobs that are in `suspended` or `scheduled` state. The `testJob` section of `ModifyTestJob_Common` is used to specify which Test Job object is a subject of the modification process (relationship by reference using `id` of the Job).

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

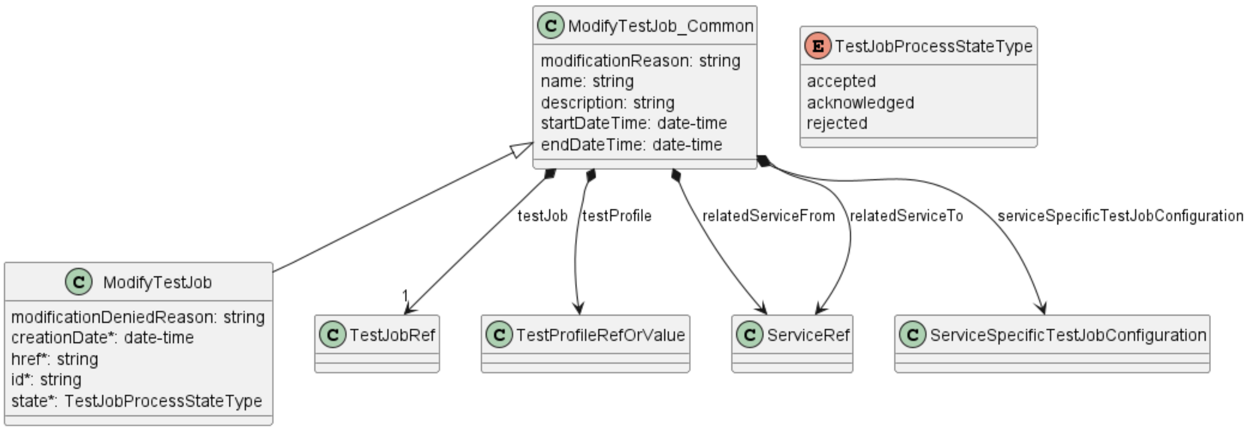


Figure 28. Modify Test Job Key Entities

To send a Modify Test Job request the Buyer/Client uses the `modifyTestJob` operation from the API: `POST /modifyTestJob`. Some of the payload's attributes might be omitted to improve examples' readability.

The example below shows a request to create a modification process for `TestJob` that was created in section 6.6.2.

The request below aims to:

- change `testProfile`
- change `requestedEndDateTime`
- modify `description` of the Test Job

```
{
  "testJob": {
    "id": "job-12345",
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345"
  },
  "modificationReason": "Change test start time and update test profile.",
  "name": "Updated Ping Test Job",
  "description": "Updated schedule and profile for site-to-site ping test",
  "requestedStartDateTime": "2025-06-14T09:00:00Z",
  "requestedEndDateTime": "2025-06-14T10:00:00Z",
  "testProfile": {
    "@type": "TestProfileRef",
    "id": "tp-002"
  },
  "relatedServiceFrom": {
    "id": "service-from-001",
    "href": "https://serverRoot/mefApi/legato/services/service-from-001"
  },
  "relatedServiceTo": {
    "id": "service-to-002",
    "href": "https://serverRoot/mefApi/legato/services/service-to-002"
  }
}
```

[R47] The Buyer’s Modify Test Job request **MUST** include the Test Job Identifier. [Mplify 136.1 R58]

[R48] The Buyer's Modify Test Job request **MUST** at least one of the following attributes: [Mplify 136.1 R59]

- `description`
- `name`
- `requestedEndDateTime`
- `requestedStartDateTime`

- `relatedServiceFrom`
- `relatedServiceTo`
- `testProfile`
- `serviceSpecificTestJobConfiguration`

[R49] The Test Job **MUST** be in the `suspended` or `scheduled` state for a Buyer/Client to modify it. [Mplify 136.1 R60]

6.9.3. Modify Test Job Response

Entities used for providing a response to Modify Test Job request are presented in Figure 27. The Seller/Server responds with a `ModifyTestJob` type, which adds some attributes (like `id` or `state`) to the `ModifyTestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

```
{
  "id": "mod-job-12345",
  "href": "https://example.com/api/modifyTestJobs/mod-job-12345",
  "state": "acknowledged",
  "creationDate": "2025-06-13T12:30:00Z",
  "modificationReason": "Change test start time and update test profile.",
  "testJob": {
    "id": "job-12345",
    "href": "https://example.com/api/testJobs/job-12345"
  },
  "name": "Updated Ping Test Job",
  "description": "Updated schedule and profile for site-to-site ping test",
  "requestedStartDateTime": "2025-06-14T09:00:00Z",
  "requestedEndDateTime": "2025-06-14T10:00:00Z",
  "testProfile": {
    "@type": "TestProfileRef",
    "id": "tp-002"
  },
  "relatedServiceFrom": {
    "id": "service-from-001",
    "href": "https://example.com/api/services/service-from-001"
  },
  "relatedServiceTo": {
    "id": "service-to-002",
    "href": "https://example.com/api/services/service-to-002"
  }
}
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R50] The Seller/Server's response **MUST** include all and unchanged attributes' values as provided by Buyer/Client in the request. [Mplify 136.1 R61]

[R51] If the request is unsuccessful, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R62]

[R52] The Seller/Server **MUST** specify the following attributes in a response:

- `creationDate`
- `id`
- `href`
- `state`

[R53] The `id` **MUST** remain the same value for the life of the Modify Test Job.

[R54] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R64]

In case Seller/Server cannot successfully validate the request, Modify Test Job process fails, which results in setting state to `rejected` with a proper explanation in `modificationDeniedReason`. This includes situation when:

- `id` does not allow to find a `TestJob` that is to be updated in Seller/Server's system
- requested attributes cannot be modified
- Test Job is in the state that does not allow for modification.

6.9.4. Modify Test Job State Machine

Figure 29 presents the Modify Test Job state machine:

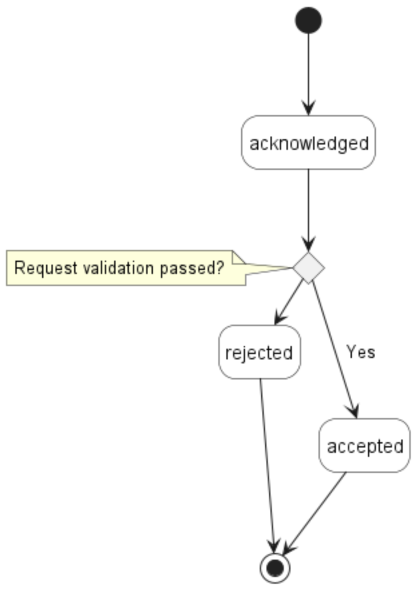


Figure 29. Modify Test Job State Machine

After receiving the request, the Seller/Server (SOF) performs basic checks of the message. If any problem is found an Error response is provided. If the validation passes a response is provided with `ModifyTestJob` in `acknowledged` state and related `TestJob` moves to `assessingModification` state. Next, the Seller/Server performs all the remaining business and time-consuming validations. At this point, an Error response cannot be provided anymore, so `ModifyTestJob` moves to a `rejected` state if some issues are found. The `modifyTestJob.modificationDeniedReason` acts as a placeholder to provide a detailed description of what caused the problem. If Modify Test Job request has been validated and accepted by the Seller/Server, `ModifyTestJob` moves to `accepted` state and `TestJob` gets updated. After `TestJob` is updated its state to changes back to `scheduled` or `inProgress`.

Table 11 presents the mapping between the API `state` names and the Mplify 136.1 naming, together with states description. The list of states is the same for all processes related to Test Job (cancel/modify/resume/suspend).

state	Mplify 136.1 name	Description
`accepted`	ACCEPTED	The Cancel/Modify/Resume/Suspend Test Job request has been validated and accepted by the Seller/Server.

state	Mplify 136.1 name	Description
`acknowledged`	ACKNOWLEDGED	The Cancel/Modify/Resume/Suspend Test Job request has been received by the Seller/Server and has passed basic validation. Test Job Process Identifier is assigned in the Acknowledged state. The request remains in the Acknowledged state until all validations as applicable are completed. If the attributes are validated, the request moves to the Accepted state. If not all attributes are validated, the request moves to the Declined state.
`rejected`	REJECTED	The Cancel/Modify/Resume/Suspend Test Job request has been rejected by the Seller/Server.

Table 11. Test Job Process State Machine states

[R55] The Seller/Server **MUST** support all Modify Test Job states and their associated transitions as described in Figure 29 and Table 11.

6.10. Use Case 10: Retrieve Modify Test Job List

The Buyer/Client can retrieve a list of Modify Test Job objects by using a `GET /modifyTestJob` operation with the desired filtering criteria.

[O8] The Buyer/Client Retrieve List of Modify Test Jobs request **MAY** contain none or more of the following attributes:

- `testJobId`
- `state`
- `creationDate.gt`
- `creationDate.lt`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/modifyTestJob?state=acknowledged&limit=10&offset=0
```

The correct response (HTTP code `200`) in the response body contains a list of `ModifyTestJob` objects matching the criteria. Details related to pagination are described in section 6.2.1.

[R56] The Seller **MUST** include the following attributes in the `ModifyTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `testJob`
- `state`

[R57] In case no items matching the criteria are found, the Seller/Server **MUST** return a valid response with an empty list.

Figure 30 presents entities related to the use case.

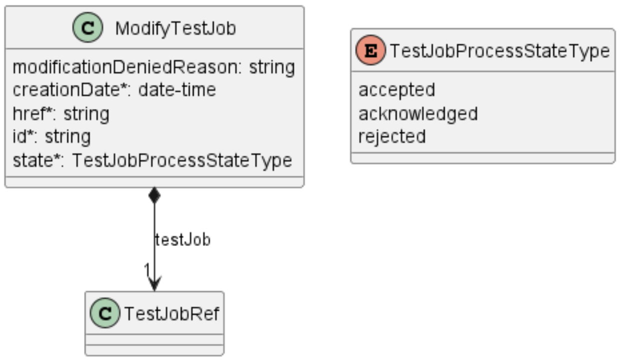


Figure 30. Use Case 10: Retrieve Modify Test Job List - Model

6.11. Use Case 11: Retrieve Modify Test Job by Identifier

The Buyer/Client can get detailed information about the Modify Test Job from the Seller/Server by using a `GET /modifyTestJob/{id}` operation. The payload returned in the response is a full representation of the Modify Test Job and includes all attributes the Buyer/Client has provided while sending a Modify Test Job create request, together with additional attributes set by Seller/Server.

Get List and Get by Identifier operations returns the `ModifyTestJob` object. A response to a Get by Id for a `ModifyTestJob` with `id=mod-job-12345` would return exactly the same response as presented in section 6.9.3.

[R58] In case `id` does not allow finding a `ModifyTestJob` in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R59] The Seller/Server **MUST** include following attributes in the `ModifyTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `testJob`
- `state`

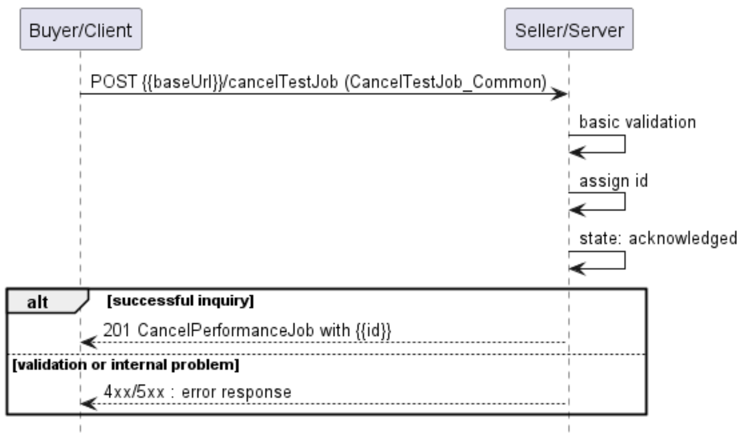
[R60] The Seller **MUST** provide all remaining optional attributes if they were previously set by the Buyer or the Seller.

6.12. Use Case 12: Cancel Test Job

Due to the need for deprovisioning of the Test Job on the SOF side, the cancel operation associated with the Test Job may exhibit a prolonged duration. Consequently, this operation is implemented through a separate lifecycle process.

6.12.1. Interaction flow

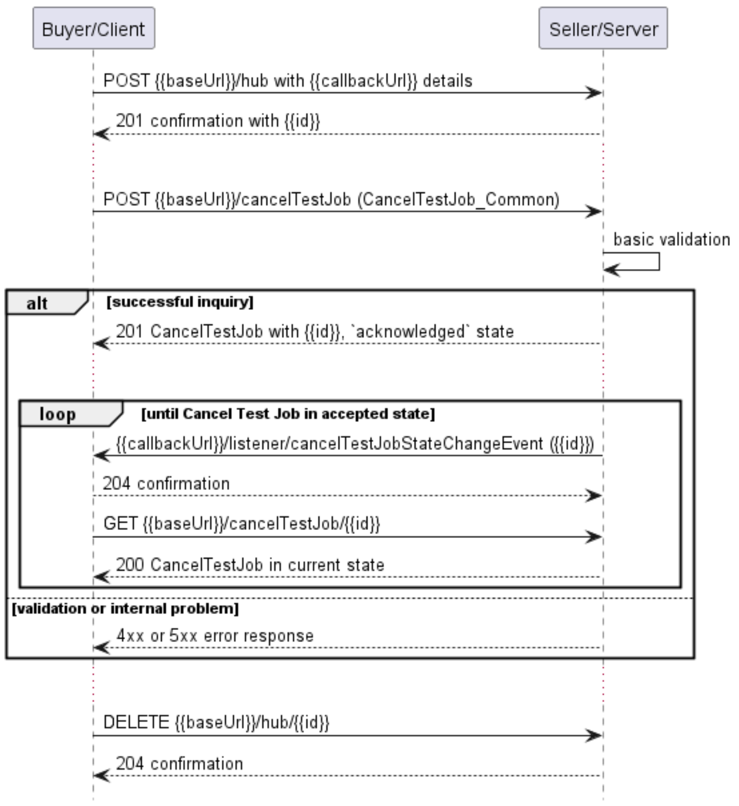
The flow of this use case is shown in Figure 31.



Buyer/Client
Seller/Server
POST {{baseUrl}}/cancelTestJob (CancelTestJob_Common)
basic validation
assign id
state: acknowledged
alt
[successful inquiry]
201 CancelPerformanceJob with {{id}}
[validation or internal problem]
4xx/5xx : error response

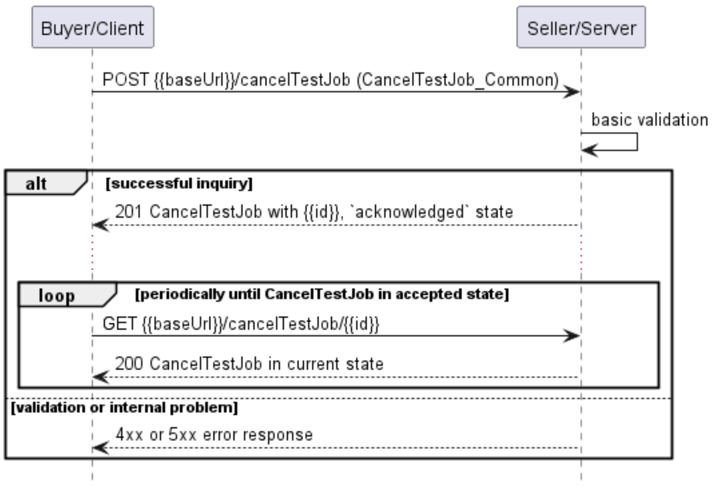
Figure 31. Use Case 12 - Cancel Test Job create request flow

The Buyer/Client sends a request with a `CancelTestJob_Common` type in the body. The Seller/Server performs request validation, assigns an `id`, and returns the `CancelTestJob` type in the response body, with a `state` set to `acknowledged`. Further processing is performed by Seller/Server which will in case of success cancel the Test Job. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `CancelTestJob`. The two patterns are presented in the following diagrams.



Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/cancelTestJob (CancelTestJob_Common)
basic validation
alt
[successful inquiry]
201 CancelTestJob with {{id}}, `acknowledged` state
loop
[until Cancel Test Job in accepted state]
{{callbackUrl}}/listener/cancelTestJobStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/cancelTestJob/{{id}}
200 CancelTestJob in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 32. Cancel Test Job progress tracking - Notifications



Buyer/Client
Seller/Server
POST {{baseUrl}}/cancelTestJob (CancelTestJob_Common)
basic validation
alt
[successful inquiry]
201 CancelTestJob with {{id}}, `acknowledged` state
loop
[periodically until CancelTestJob in accepted state]
GET {{baseUrl}}/cancelTestJob/{{id}}
200 CancelTestJob in current state
[validation or internal problem]
4xx or 5xx error response

Figure 33. Cancel Test Job progress tracking - Polling

6.12.2. Cancel Test Job Request

Figure 34 presents the most important part of the data model used during the Cancel Test Job request `POST /cancelTestJob` and response. The model of the request message - `CancelTestJob_Common` contains only attributes that can (or must) be set by the Buyer/Client. The Seller/Server (SOF) then enriches the entity in the response with additional information.

The `testJob` section of `CancelTestJob_Common` is used to specify which Test Job object is a subject of the cancellation process (relationship by reference using `id` of the Job).

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

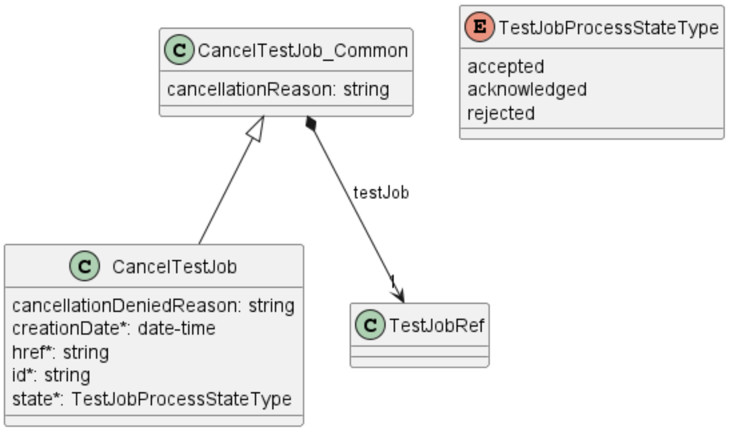


Figure 34. Cancel Test Job Key Entities

To send a Cancel Test Job request the Buyer/Client uses the `cancelTestJob` operation from the API: `POST /cancelTestJob`.

The example below shows a request to create a cancellation process for `TestJob` that was created in section 6.6.2.

```
{
  "cancellationReason": "Cancel Test Job sample",
  "testJob": {
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
    "id": "job-12345"
  }
}
```

[R61] The Buyer's/Client's Cancel Test Job request **MUST** include the following attributes: [Mplify133.1 R57]

- `testJob`

Note If action arrives when Test Job is running, it is recommended to run until the end and only afterward action should be applied. [Mplify133.1 O16, O26]

6.12.3. Cancel Test Job Response

Entities used for providing a response to Cancel Test Job requests are presented in Figure 34. The Seller/Server responds with a `CancelTestJob` type, which adds some attributes (like `id` or `state`) to the `CancelTestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

```
{
  "cancellationReason": "Cancel Test Job sample",
  "testJob": {
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
    "id": "job-12345"
  },
  "creationDate": "204-06-19T12:58:17.088Z", << added by SOF >>
   "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/CancelTestJob/cancel-job-12345", << added by
SOF >>
  "id": "cancel-job-12345", << added by SOF >>
  "state": "acknowledged" << added by SOF >>
}
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R62] The Seller/Server's response **MUST** include all and unchanged attributes' values as provided by the Buyer/Client in the request.

[R63] The Seller/Server **MUST** specify the following attributes in a response:

- `creationDate`
- `id`
- `href`
- `state`
- `testJob`

[R64] The `id` **MUST** remain the same value for the life of the Cancel Test Job.

In case Seller/Server cannot successfully validate the request, Cancel Test Job process fails, which results in setting the state to `rejected` with a proper explanation in `cancellationDeniedReason`. This includes situation when:

- `id` does not allow to find a `TestJob` that is to be cancelled in Seller/Server's system
- Test Job is in a state that does not allow for cancellation.

6.12.4. Cancel Test Job State Machine

Figure 35 presents the Cancel Test Job state machine:

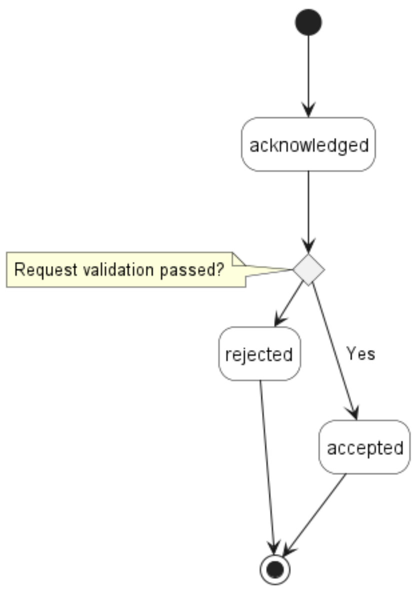


Figure 35. Cancel Test Job State Machine

After receiving the request, the Seller/Server (SOF) performs basic checks of the message. If any problem is found an Error response is provided. If the validation passes a response is provided with `CancelTestJob` in `acknowledged` state and related `TestJob` moves to `assessingCancellation` state. Next, the Seller/Server performs all the remaining business and time-consuming validations. At this point, an Error response cannot be provided anymore, so the Cancel Test Job moves to a `rejected` state if some issues are found. The `cancelTestJob.cancellationDeniedReason` acts as a placeholder to provide a detailed description of what caused the problem. If the Cancel Test Job request has been validated and accepted by the Seller/Server, `CancelTestJob` moves to `accepted` state and `TestJob` state is `cancelled`.

Description and mapping of the Cancel Test Job States are the same as in table 10.

6.13. Use Case 13: Retrieve Cancel Test Job List

The Buyer/Client can retrieve a list of Cancel Test Job objects by using a `GET /cancelTestJob` operation with desired filtering criteria.

[O9] The Buyer/Client Retrieve List of Cancel Test Jobs request **MAY** contain none or more of the following attributes:

- `testJobId`
- `state`
- `creationDate.gt`
- `creationDate.lt`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/cancelTestJob?state=acknowledged&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Cancel Test Job objects that are in the `acknowledged` state.The correct response (HTTP code `200`) in the response body contains a list of `CancelTestJob` objects matching the criteria. Details related to pagination are described in section 6.2.1.

[R65] The Seller **MUST** include following attributes in the `CancelTestJob` object in the response:

- `creationDate`
- `id`

- `href`
- `testJob`
- `state`

[R66] In case no items matching the criteria are found, the Seller/Server **MUST** return a valid response with an empty list.

Figure 36 presents entities related to the use case.

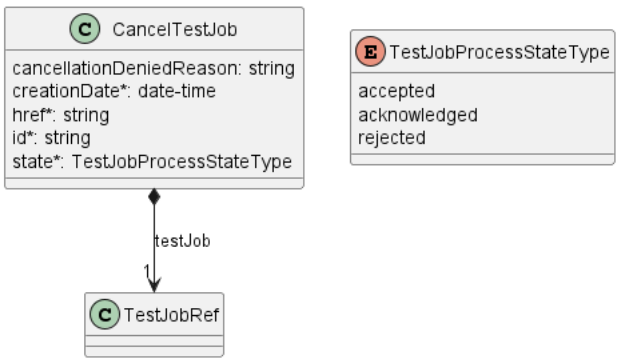


Figure 36. Use Case 13: Retrieve Cancel Test Job List - Model

6.14. Use Case 14: Retrieve Cancel Test Job by Identifier

The Buyer/Client can get detailed information about the Cancel Test Job from the Seller/Server by using a `GET /cancelTestJob/{id}` operation. The payload returned in the response is a full representation of the Cancel Test Job and includes all attributes the Buyer/Client has provided while sending a Cancel Test Job create request, together with additional attributes set by Seller/Server.

Get List and Get by Identifier operations returns the `CancelTestJob` object. A response to a Get by Id for a `CancelTestJob` with `id=cancel-job-12345` would return exactly the same response as presented in section 6.13.3.

[R67] In case `id` does not allow finding a `CancelTestJob` in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R68] The Seller/Server **MUST** include following attributes in the `CancelTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `testJob`
- `state`

[R69] The Seller **MUST** provide all remaining optional attributes if they were previously set by the Buyer or the Seller.

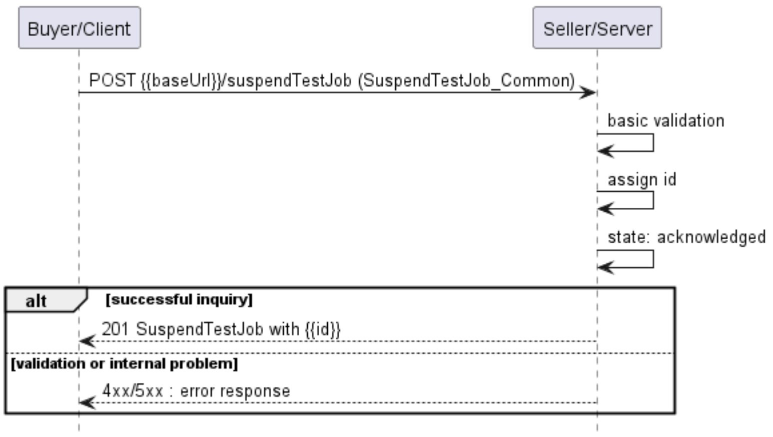
6.15. Use Case 15: Suspend Test Job

Due to the need to release resources on the SOF side, the suspend operation associated with the Test Job may exhibit a prolonged duration. Consequently, this operation is implemented through a separate lifecycle process.

When the Test Job is suspended, it does not perform any tests nor collects test results.

6.15.1. Interaction flow

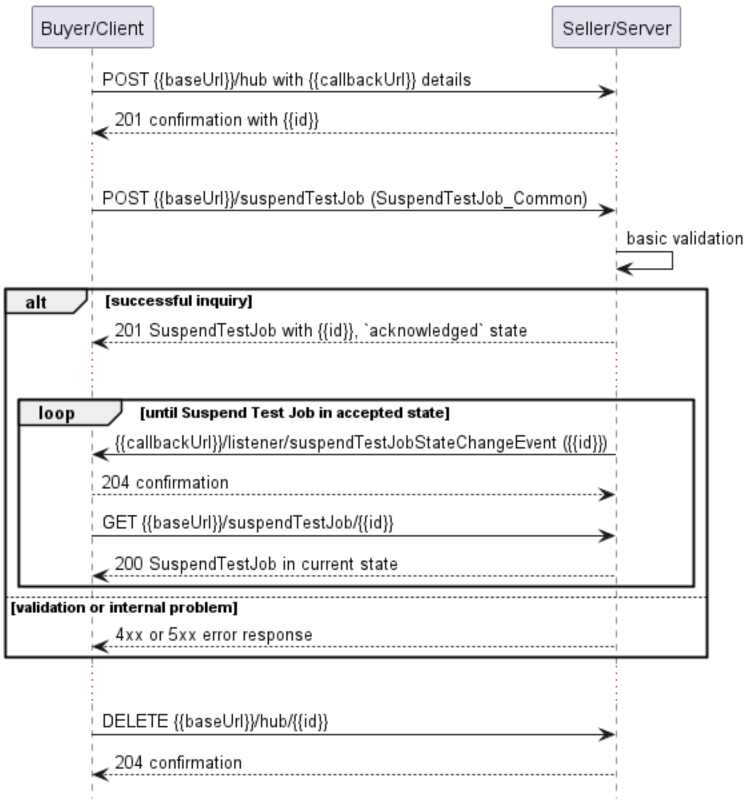
The flow of this use case is shown in Figure 37.



Buyer/Client
Seller/Server
POST {{baseUrl}}/suspendTestJob (SuspendTestJob_Common)
basic validation
assign id
state: acknowledged
alt
[successful inquiry]
201 SuspendTestJob with {{id}}
[validation or internal problem]
4xx/5xx : error response

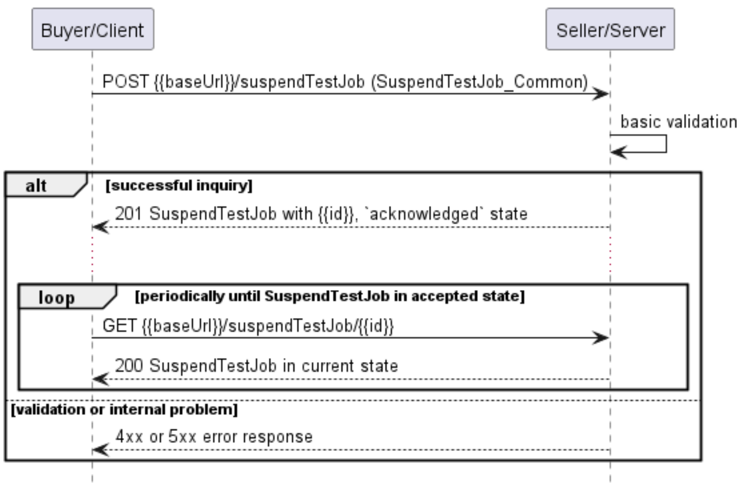
Figure 37. Use Case 15 - Suspend Test Job create request flow

The Buyer/Client sends a request with a `SuspendTestJob_Common` type in the body. The Seller/Server performs request validation, assigns an `id`, and returns the `SuspendTestJob` type in the response body, with a `state` set to `acknowledged`. Further processing is performed by Seller/Server which will in case of success suspends the Test Job. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `SuspendTestJob`. The two patterns are presented in the following diagrams.



Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/suspendTestJob (SuspendTestJob_Common)
basic validation
alt
[successful inquiry]
201 SuspendTestJob with {{id}}, `acknowledged` state
loop
[until Suspend Test Job in accepted state]
{{callbackUrl}}/listener/suspendTestJobStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/suspendTestJob/{{id}}
200 SuspendTestJob in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 38. Suspend Test Job progress tracking - Notifications



Buyer/Client
Seller/Server
POST {{baseUrl}}/suspendTestJob (SuspendTestJob_Common)
basic validation
alt
[successful inquiry]
201 SuspendTestJob with {{id}}, `acknowledged` state
loop
[periodically until SuspendTestJob in accepted state]
GET {{baseUrl}}/suspendTestJob/{{id}}
200 SuspendTestJob in current state
[validation or internal problem]
4xx or 5xx error response

Figure 39. Suspend Test Job progress tracking - Polling

Note: The Suspend Test Job process is altering the state of the job itself. It is important to note that notifications resulting from changes in the state of the Test Job are not represented in Figures 37 and 38.

6.15.2. Suspend Test Job Request

Figure 40 presents the most important part of the data model used during the Suspend Test Job request (`POST /suspendTestJob`) and response. The model of the request message - `SuspendTestJob_Common` contains only attributes that can (or must) be set by the Buyer/Client. The Seller/Server (SOF) then enriches the entity in the response with additional information.

The `testJob` section of `SuspendTestJob_Common` is used to specify which Test Job object is a subject of the suspension process (relationship by reference using `id` of the Job).

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

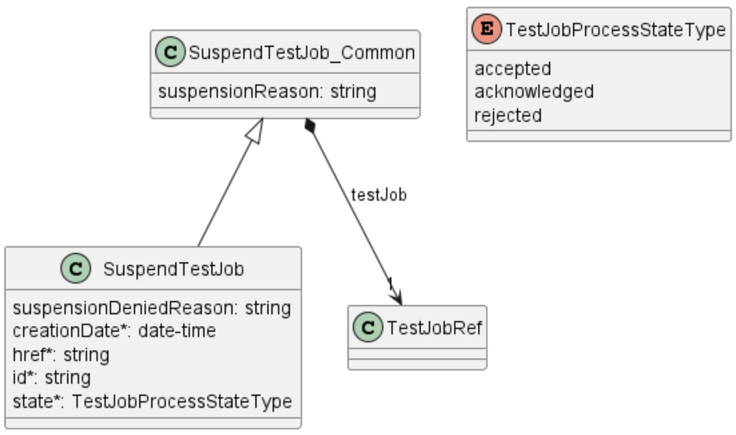


Figure 40. Suspend Test Job Key Entities

To send a Suspend Test Job request the Buyer/Client uses the `suspendTestJob` operation from the API: `POST /suspendTestJob`.

The example below shows a request to create a suspension process for `TestJob` that was created in section 6.6.2.

```
{
  "testJob": {
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
    "id": "job-12345"
  },
  "suspensionReason": "Suspend Test Job sample"
}
```

[R70] The Buyer/Client Suspend Test Job request **MUST** include the following attributes: [Mplify 136.1 R40]

- `testJob`

[R71] The Test Job **MUST** be in the `inProgress` state to be suspended. [Mplify 136.1 R41]

[O10] In case the Test Job is running e.g., once a day for a short period of time, it may be difficult to change its state. If action arrives when Test Job is running, it is recommended to run until the end and only afterwards action should be applied.

6.15.3. Suspend Test Job Response

Entities used for providing a response to Suspend Test Job requests are presented in Figure 40. The Seller/Server responds with a `SuspendTestJob` type, which adds some attributes (like `id` or `state`) to the `SuspendTestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

```
  {
    "testJob": {
      "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
      "id": "job-12345"
    },
    "suspensionReason": "Suspend Test Job sample",
    "creationDate": "204-06-19T12:58:17.088Z", << added by SOF >>
     "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/suspendTestJob/suspend-job-12345", << added
  by SOF >>
    "id": "suspend-job-12345", << added by SOF >>
    "state": "acknowledged" << added by SOF >>
  }
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R72] If the request is successful, the Seller/Server **MUST** suspend all testing and measurements being performed on the Test Job and place the Test Job in the `suspended` state when they receive a Suspend Test Job request from the Buyer/Client [Mplify 136.1 R42]

[R73] While in the `suspended` state, the Test Job **MUST NOT** perform any testing or measurements. [Mplify 136.1 R43]

[R74] If the request is not successful, the Seller/Server **MUST NOT** suspend the Test Job [Mplify 136.1 R44]

[R75] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client [Mplify 136.1 R45]

[R76] The Seller/Server's response **MUST** include all and unchanged attributes' values as provided by the Buyer/Client in the request.

[R77] The Seller/Server **MUST** specify the following attributes in a response:

- `creationDate`
- `id`
- `href`
- `state`
- `testJob`

[R78] The `id` **MUST** remain the same value for the life of the Suspend Test Job.

In case Seller/Server cannot successfully validate the request, Suspend Test Job process fails, which results in setting the state to `rejected` with a proper explanation in `suspensionDeniedReason`. This includes situations when:

- `id` does not allow to find a `TestJob` that is to be suspended in Seller/Server's system
- Test Job is in a state that does not allow for suspension.

6.15.4. Suspend Test Job State Machine

Figure 41 presents the Suspend Test Job state machine:

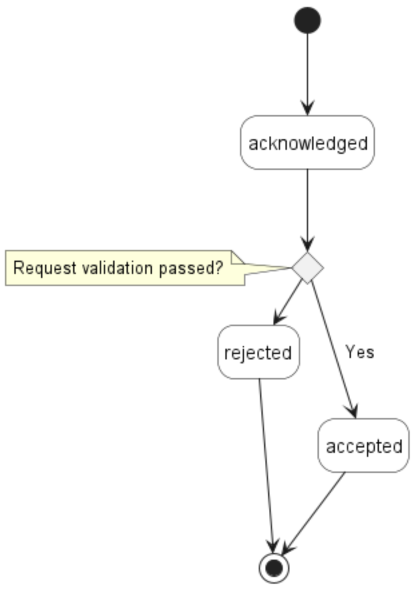


Figure 41. Suspend Test Job State Machine

After receiving the request, the Seller/Server (SOF) performs basic checks of the message. If any problem is found an Error response is provided. If the validation passes a response is provided with `SuspendTestJob` in `acknowledged` state. Next, the Seller/Server performs all the remaining business and time-consuming validations. At this point, an Error response cannot be provided anymore, so the Suspend Test Job moves to a `rejected` state if some issues are found. The `suspendTestJob.suspensionDeniedReason` acts as a placeholder to provide a detailed description of what caused the problem. If the Suspend Test Job request has been validated and accepted by the Seller/Server, `SuspendTestJob` moves to `accepted` state and `TestJob` state is `suspended`.

Description and mapping of the Suspend Test Job States are the same as in table 10.

6.16. Use Case 16: Retrieve Suspend Test Job List

The Buyer/Client can retrieve a list of Suspend Test Job objects by using a `GET /suspendTestJob` operation with desired filtering criteria.

[O11] The Buyer/Client Retrieve List of Suspend Test Jobs request **MAY** contain none or more of the following attributes:

- `testJobId`
- `state`
- `creationDate.gt`
- `creationDate.lt`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/suspendTestJob?state=acknowledged&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Suspend Test Job objects that are in the `acknowledged` state. The correct response (HTTP code `200`) in the response body contains a list of `SuspendTestJob` objects matching the criteria. Details related to pagination are described in section 6.2.1.

[R79] The Seller **MUST** include following attributes in the `SuspendTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `state`
- `testJob`

[R80] In case no items matching the criteria are found, the Seller/Server **MUST** return a valid response with an empty list.

Figure 42 presents entities related to the use case.

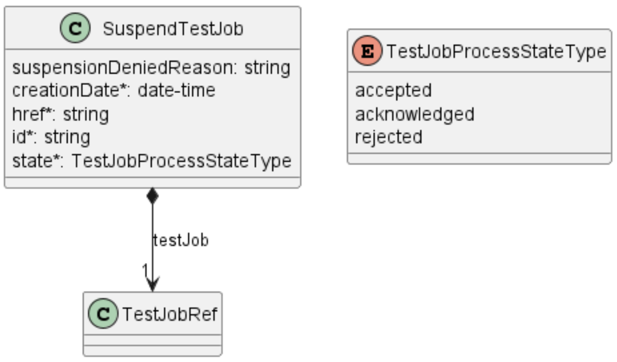


Figure 42. Use Case 16: Retrieve Suspend Test Job List - Model

6.17. Use Case 17: Retrieve Suspend Test Job by Identifier

The Buyer/Client can get detailed information about the Suspend Test Job from the Seller/Server by using a `GET /suspendTestJob/{id}` operation. The payload returned in the response is a full representation of Suspend Test Job and includes all attributes the Buyer/Client has provided while sending a Suspend Test Job create request, together with additional attributes set by Seller/Server.

Get List and Get by Identifier operations returns the `SuspendTestJob` object. A response to a Get by Identifier for a `SuspendTestJob` with `id=suspend-job-12345` would return exactly the same response as presented in section 6.16.3.

[R81] In case `id` does not allow finding a `SuspendTestJob` in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R82] The Seller/Server **MUST** include following attributes in the `SuspendTestJob` object in the response:

- creationDate
- id
- href
- state
- testJob

[R83] The Seller **MUST** provide all remaining optional attributes if they were previously set by the Buyer or the Seller.

6.18. Use Case 18: Resume Test Job

Due to the need for reserving resources on the SOF side, the resume operation associated with Test Job may exhibit prolonged duration. Consequently, this operation is implemented through a separate lifecycle process.

6.18.1. Interaction flow

The flow of this use case is shown in Figure 43.

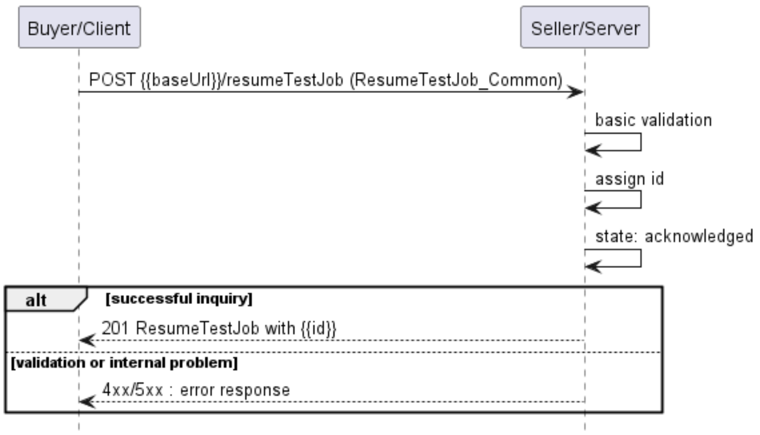
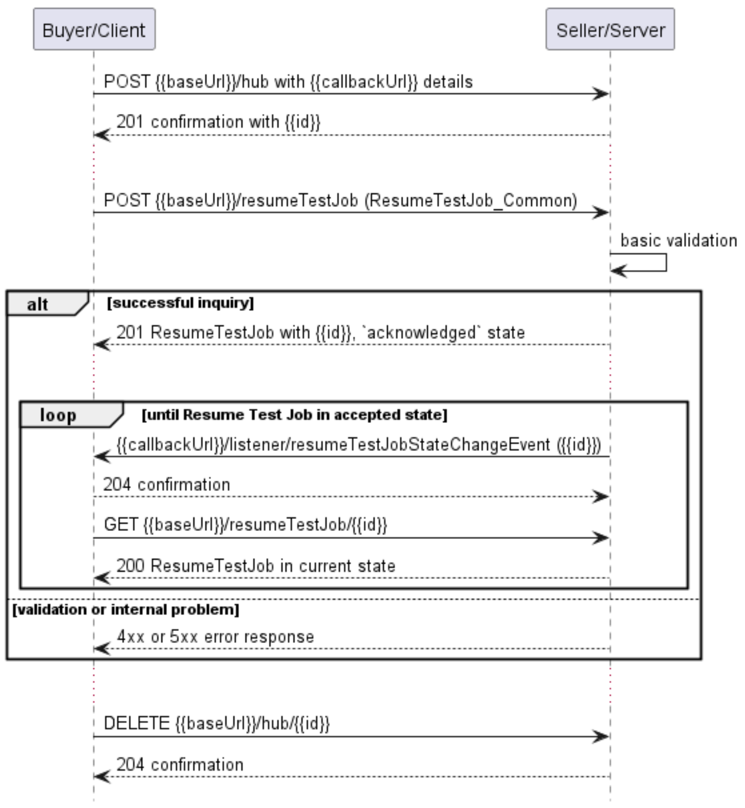


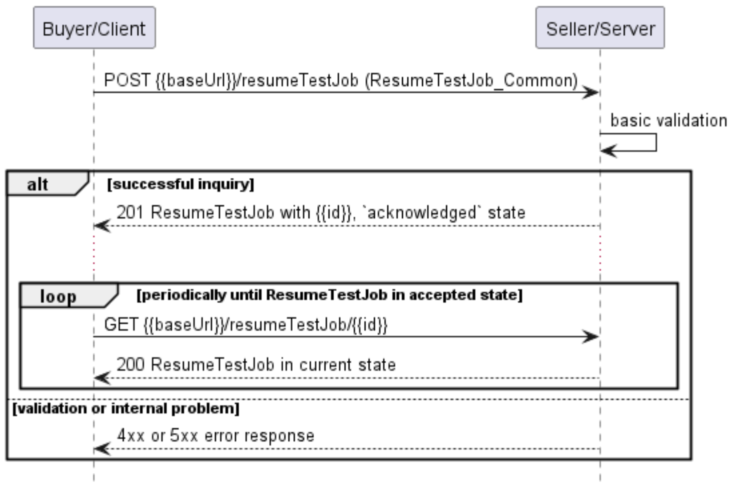
Figure 43. Use Case 18 - Resume Test Job create request flow

The Buyer/Client sends a request with a `ResumeTestJob_Common` type in the body. The Seller/Server performs request validation, assigns an `id`, and returns the `ResumeTestJob` type in the response body, with a `state` set to `acknowledged`. Further processing is performed by Seller/Server which will in case of success resume the Test Job. The Buyer/Client can track the progress of the process either by subscribing for notifications or by periodically polling the `ResumeTestJob`. The two patterns are presented in the following diagrams.



Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/resumeTestJob (ResumeTestJob_Common)
basic validation
alt
[successful inquiry]
201 ResumeTestJob with {{id}}, `acknowledged` state
loop
[until Resume Test Job in accepted state]
{{callbackUrl}}/listener/resumeTestJobStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/resumeTestJob/{{id}}
200 ResumeTestJob in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 44. Resume Test Job progress tracking - Notifications



Buyer/Client
Seller/Server
POST {{baseUrl}}/resumeTestJob (ResumeTestJob_Common)
basic validation
alt
[successful inquiry]
201 ResumeTestJob with {{id}}, `acknowledged` state
loop
[periodically until ResumeTestJob in accepted state]
GET {{baseUrl}}/resumeTestJob/{{id}}
200 ResumeTestJob in current state
[validation or internal problem]
4xx or 5xx error response

Figure 45. Resume Test Job progress tracking - Polling

6.18.2. Resume Test Job Request

Figure 46 presents the most important part of the data model used during the Resume Test Job request (`POST /resumeTestJob`) and response. The model of the request message - `ResumeTestJob_Common` contains only attributes that can (or must) be set by the Buyer/Client. The Seller/Server then enriches the entity in the response with additional information.

The `testJob` section of `ResumeTestJob_Common` is used to specify which Test Job object is a subject of the resume process (relationship by reference using the `id` of the Job).

The full list of attributes is available in Section 7 and in the API specification which is an integral part of this standard.

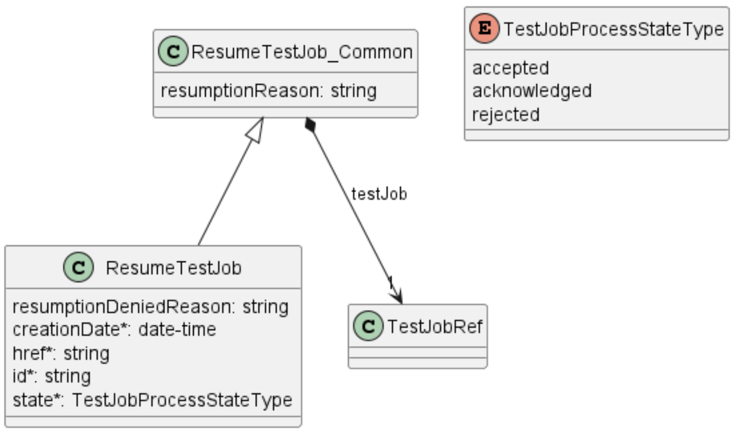


Figure 46. Resume Test Job Key Entities

To send a Resume Test Job request the Buyer/Client uses the `resumeTestJob` operation from the API: `POST /resumeTestJob`.

The example below shows a request to create a resumption process for `TestJob` that was created in section 6.6.2.

```
{
  "testJob": {
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
    "id": "job-12345"
  },
  "resumptionReason": "Resume Test Job sample"
}
```

[R84] The Buyer/Client Resume Test Job request **MUST** include the following attributes: [Mplify 136.1 R46]

- `testJob`

[R85] The Test Job **MUST** be in the `suspended` state in order to be resumed. [Mplify 136.1 R47]

6.18.3. Resume Test Job Response

Entities used for providing a response to Resume Test Job requests are presented in Figure 46. The Seller/Server responds with a `ResumeTestJob` type, which adds some attributes (like `id` or `state`) to the `ResumeTestJob_Common` that was used in the Buyer/Client request.

The following snippet presents the Seller/Server response. It has the same structure as in the retrieve by identifier operation.

```
{
  "testJob": {
    "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testJob/job-12345",
    "id": "job-12345"
  },
  "resumptionReason": "Resume Test Job sample",
  "creationDate": "204-06-19T12:58:17.088Z", << added by SOF >>
   "href": "https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/resumeTestJob/resume-job-12345", << added by
SOF >>
  "id": "resume-job-12345", << added by SOF >>
  "state": "acknowledged" << added by SOF >>
}
```

Attributes that are set by the Seller/Server in the response are marked with the `<< added by SOF >>` tag.

[R86] If the request is successful, the Seller/Server **MUST** resume all testing and measurement being performed on the Test Job and place the Test Job in the `inProgress` state when they receive a Resume Test Job request from the Buyer/Client [Mplify 136.1 R48]

[R87] If the request is not successful, the Seller/Server **MUST NOT** resume the Test Job, and the Test Job remains in the `suspended` state. [Mplify 136.1 R49]

[R88] If the Seller/Server encounters errors, they **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R50]

[R89] The Seller/Server's response **MUST** include all and unchanged attributes' values as provided by the Buyer/Client in the request.

[R90] The Seller/Server **MUST** specify the following attributes in a response:

- `creationDate`
- `id`
- `href`
- `state`
- `testJob`

[R91] The `id` **MUST** remain the same value for the life of the Test Job.

In case the Seller/Server cannot successfully validate the request, the Resume Test Job process fails, which results in setting the state to `rejected` with a proper explanation in `resumptionDeniedReason`. This includes situations when:

- `id` does not allow to find a `TestJob` that is to be resumed in Seller/Server's system
- Test Job is in a state that does not allow for resumption.

6.18.4. Resume Test Job State Machine

Figure 47 presents the Resume Test Job state machine:

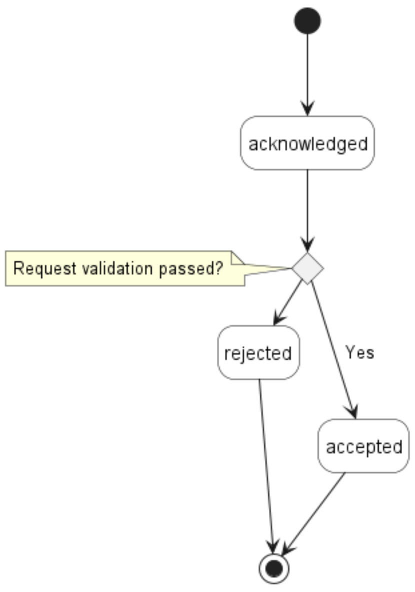


Figure 47. Resume Test Job State Machine

After receiving the request, the Seller/Server (SOF) performs basic checks of the message. If any problem is found an Error response is provided. If the validation passes a response is provided with `ResumeTestJob` in `acknowledged` state. Next, the Seller/Server performs all the remaining business and time-consuming validations. At this point, an Error response cannot be provided anymore, so the Resume Test Job moves to a `rejected` state if some issues are found. The `resumeTestJob.resumptionDeniedReason` acts as a placeholder to provide a detailed description of what caused the problem. If the Resume Test Job request has been validated and accepted by the Seller/Server, `ResumeTestJob` moves to `accepted` state and `TestJob` state is `inProgress`.

Description and mapping of the Resume Test Job States are the same as in table 10.

6.19. Use Case 19: Retrieve Resume Test Job List

The Buyer/Client can retrieve a list of Resume Test Job objects by using a `GET /resumeTestJob` operation with desired filtering criteria.

[O12] The Buyer/Client Retrieve List of Resume Test Jobs request **MAY** contain none or more of the following attributes:

- `testJobId`
- `state`
- `creationDate.gt`
- `creationDate.lt`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/resumeTestJob?state=acknowledged&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Resume Test Job objects that are in the `acknowledged` state. The correct response (HTTP code `200`) in the response body contains a list of `ResumeTestJob` objects matching the criteria. Details related to pagination are described in section 6.2.1.

[R92] The Seller **MUST** include following attributes in the `ResumeTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `testJob`
- `state`

[R93] In case no items matching the criteria are found, the Seller/Server **MUST** return a valid response with an empty list.

Figure 48 presents entities related to the use case.

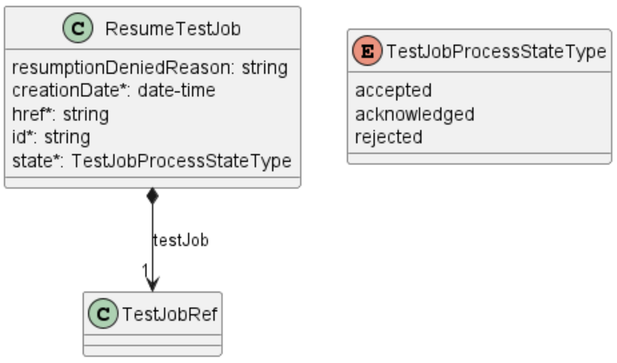


Figure 48. Use Case 19: Retrieve Resume Test Job List - Model

6.20. Use Case 20: Retrieve Resume Test Job by Identifier

The Buyer/Client can get detailed information about the Resume Test Job from the Seller/Server by using a `GET /resumeTestJob/{id}` operation. The payload returned in the response is a full representation of the Resume Test Job and includes all attributes the Buyer/Client has provided while sending a Resume Test Job create request, together with additional attributes set by Seller/Server.

Get List and Get by Identifier operations returns the `ResumeTestJob` object. A response to a Get by Identifier for a `ResumeTestJob` with `id=resume-job-12345` would return exactly the same response as presented in section 6.19.3.

[R94] In case `id` does not allow finding a `ResumeTestJob` in Seller/Server's system, an error response `Error404` **MUST** be returned.

[R95] The Seller/Server **MUST** include following attributes in the `ResumeTestJob` object in the response:

- `creationDate`
- `id`
- `href`
- `testJob`
- `state`

[R96] The Seller **MUST** provide all remaining optional attributes if they were previously set by the Buyer or the Seller.

6.21. Use Case 21: Retrieve Test Result List

The Buyer can retrieve a list of `TestResult_Common` by using a `GET /testResult` operation with desired filtering criteria.

[O13] The Buyer/ClientResultRetrieve Test Result List request **MAY** contain none or more of the following filter criteria: [Mplify 136.1 O5]

- `testJobId`
- `relatedServiceIdFrom`
- `relatedServiceIdTo`
- `relatedServiceSpecificationId`
- `relatedContactInformationName`
- `requestedStartDateTime.gt`
- `requestedStartDateTime.lt`
- `requestedEndDateTime.gt`
- `requestedEndDateTime.lt`

```
https://serverRoot/mefApi/legato/serviceFunctionTesting/v3/testResult?relatedServiceIdFrom=service-from-
001&limit=10&offset=0
```

The example above shows a Buyer/Client's request to get all Test Result objects that have `relatedServiceIdFrom` equal `service-from-001`. The correct response (HTTP code `200`) in the response body contains a list of `TestResult_Common` objects matching the criteria. To get all the details, the Buyer/Client has to query a specific `TestJob` by its `id`. Details related to pagination are described in section 6.2.1

[R97] If successful, the Seller/Server **MUST** return a list `TestResult_Common` objects that match the selected filter criteria. [Mplify 136.1 R38]

[R98] If successful but no matches to the filter criteria are found, the Seller/Server **MUST** return an empty list

[R99] If errors are encountered, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R39]

Figure 49 presents entities related to the use case.

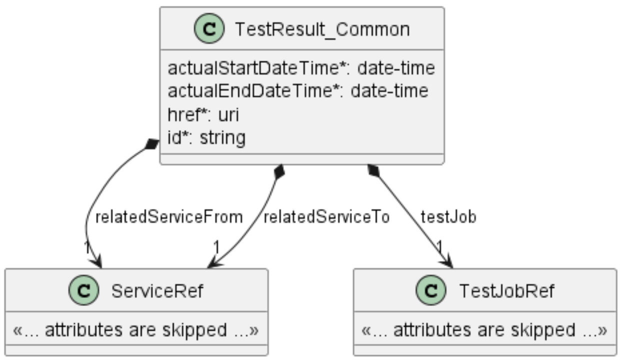

TestResult_Common
actualStartDateTime*: date-time
actualEndDateTime*: date-time
href*: uri
id*: string
relatedServiceFrom
relatedServiceTo
testJob
1
1
1
ServiceRef
«... attributes are skipped ...»
TestJobRef
«... attributes are skipped ...»

Figure 49. Use Case 21: Retrieve Test Result List - Model

6.22. Use Case 22: Retrieve Test Result by Test Result Identifier

The Buyer/Client can get detailed information about the Test Result from the Seller/Server by using a `GET /testResult/{id}` operation. The payload returned in the response is a full representation of the Test Result and includes all attributes, together with Test Result attributes set by Seller/Server.

Get List and Get by Identifier operations return different representations of Test Job. Get List returns the `TestResult_Common` object.

The following snippet presents the Seller/Server `TestResult` response.

Test Result Response

```
{
  "id": "testresult-001",
  "href": "https://serverRoot/mefApi/legato/testResults/testresult-001",
  "actualStartDateTime": "2025-06-12T08:00:00Z",
  "actualEndDateTime": "2025-06-12T08:05:00Z",
  "relatedServiceFrom": {
    "id": "service-from-001",
    "href": "https://serverRoot/mefApi/legato/services/service-from-001"
  },
  "relatedServiceTo": {
    "id": "service-to-002",
    "href": "https://serverRoot/mefApi/legato/services/service-to-002"
  },
  "testJob": {
    "id": "job-12345",
    "href": "https://serverRoot/serviceFunctionTesting/v3/testJob/job-12345"
  },
  "ServiceSpecificTestResultConfiguration": {
    "@type": "urn:mef:lso:spec:legato:ping-report:v0.0.1:all",
    "interface": {
      "name": "SiteA-Port1",
      "description": "Test port at Site A",
      "cloudService": false,
      "ipvcEndpoint": ["endpoint-001"]
    },
    "vlan": 100,
    "startTime": "2025-06-12T08:00:00Z",
    "endTime": "2025-06-12T08:05:00Z",
    "protocol": "IPV4",
    "numberOfTxPackets": 100,
    "numberOfRxPackets": 98,
    "minimumRoundTripDelay": {
      "amount": 2,
      "units": "ms"
    },
    "averageRoundTripDelay": {
      "amount": 4,
      "units": "ms"
    },
    "maximumRoundTripDelay": {
      "amount": 10,
      "units": "ms"
    },
    "countOfLostPackets": 2,
    "percentageOfLostPackets": 2.0
  }
}
```

[R100] The Buyer/Client's Retrieve Test Result by Identifier request **MUST** include the Test Result Identifier and only the Test Result Identifier. [Mplify 136.1 R40]

[R101] If successful, the Seller/Server **MUST** include all `TestResult` attributes in their response. [Mplify 136.1 R41]

[R102] If errors are encountered, the Seller/Server **MUST** return an error with explanation to the Buyer/Client. [Mplify 136.1 R42]

[R103] In case `id` does not allow finding a `TestResult` in Seller/Server's system, an error response `Error404` **MUST** be returned.

6.23. Use Case 23: Register for Notifications

The Buyer/Client can track the lifecycle of the SFT objects by subscribing to notifications. An exemplary use case for exchanging notifications is presented in Figure 50.

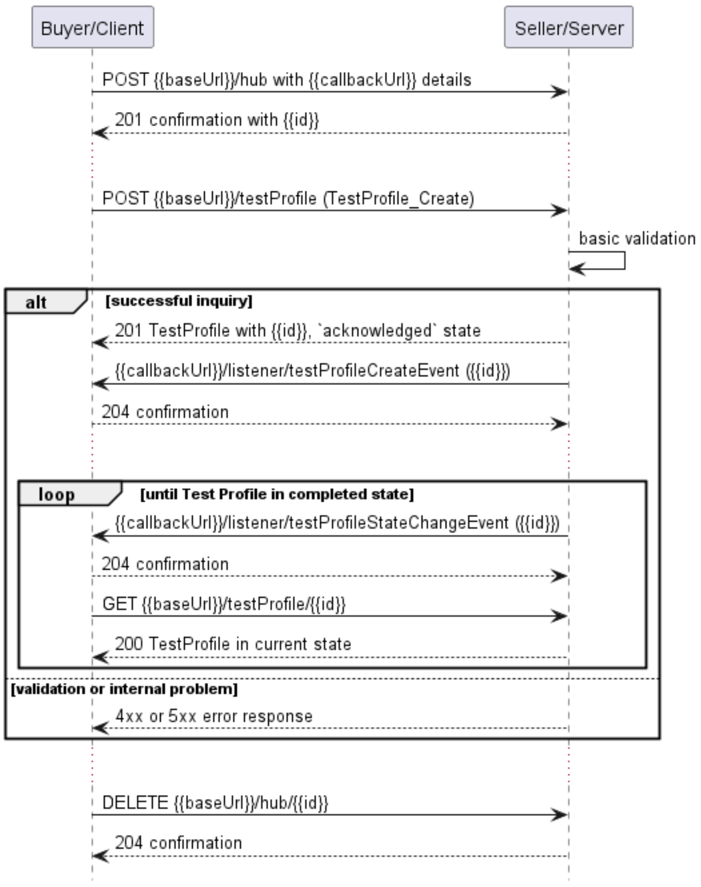

Buyer/Client
Seller/Server
POST {{baseUrl}}/hub with {{callbackUrl}} details
201 confirmation with {{id}}
POST {{baseUrl}}/testProfile (TestProfile_Create)
basic validation
alt
[successful inquiry]
201 TestProfile with {{id}}, `acknowledged` state
{{callbackUrl}}/listener/testProfileCreateEvent ({{id}})
204 confirmation
loop
[until Test Profile in completed state]
{{callbackUrl}}/listener/testProfileStateChangeEvent ({{id}})
204 confirmation
GET {{baseUrl}}/testProfile/{{id}}
200 TestProfile in current state
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 50. Testing Notification Example

The Seller/Server communicates with the Buyer/Client with Notifications provided that:

- Buyer/Client supports a notification mechanism
- Buyer/Client has registered to receive notifications from the Seller/Server

To register for notifications the Buyer/Client uses the `registerListener` operation from the API: `POST /hub`. The request contains only 2 attributes:

- `callback` - mandatory, to provide the callback address the events will be notified to,
- `query` - optional, to provide the required types of event.

Figure 51 shows all entities involved in the Notification use cases.

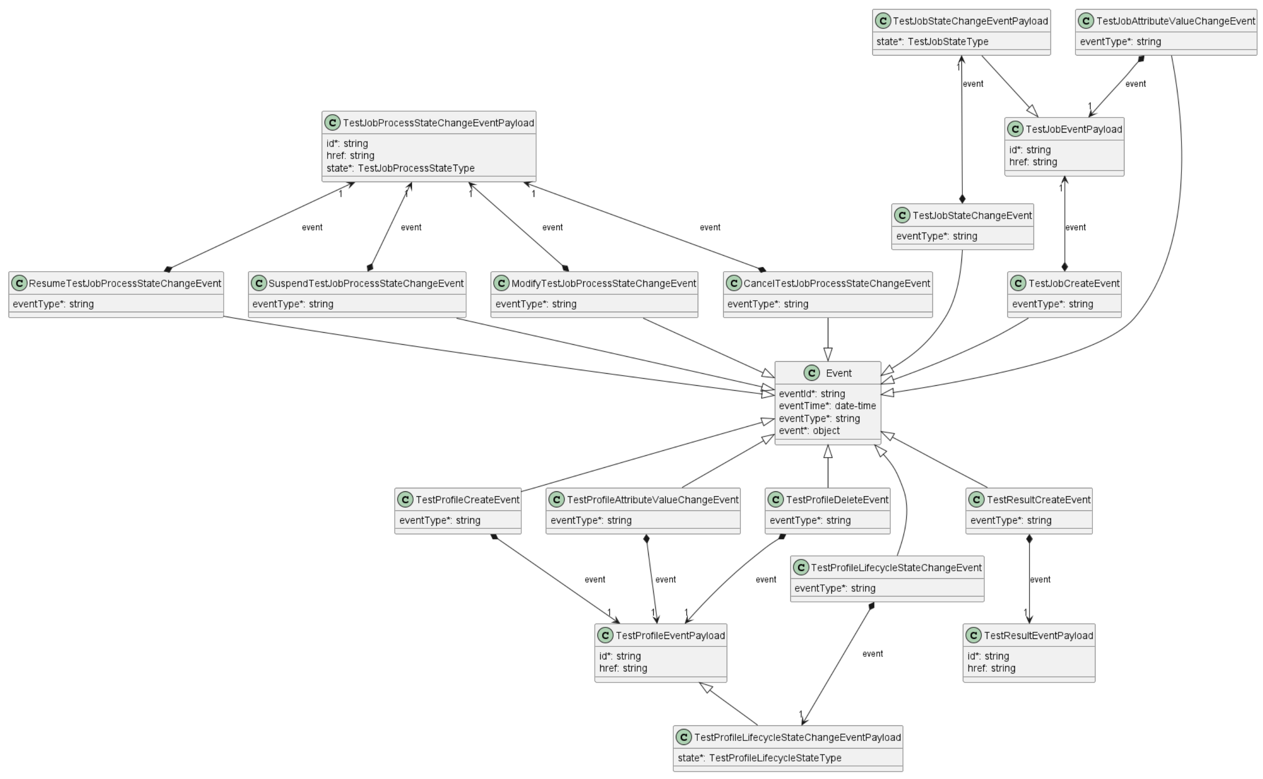


Figure 51. Service Function Testing Notification Data Model

By using a request in the following snippet, the Buyer/Client subscribes for notification of all types of events. Those are:

- `testJobCreateEvent`
- `testJobAttributeValueChangeEvent`
- `testJobStateChangeEvent`
- `cancelTestJobStateChangeEvent`
- `modifyTestJobStateChangeEvent`
- `suspendTestJobStateChangeEvent`
- `resumeTestJobStateChangeEvent`
- `testProfileCreateEvent`
- `testProfileAttributeValueChangeEvent`
- `testProfileLifecycleStateChangeEvent`
- `testProfileDeleteEvent`
- `testResultCreateEvent`

```
{
  "callback": "https://buyer.mplify.com/listenerEndpoint"
}
```

[O14] The Seller/Server **MAY** support subscription to Test Job Notifications Use Case.

[O15] The Buyer/Client **MAY** support subscription to Test Profile Notifications Use Case.

[O16] The Buyer/Client **MAY** support subscription to Test Result Notifications Use Case.

If the Buyer/Client wishes to receive only notifications of a certain type, a `query` must be added:

```
{
  "callback": "https://buyer.mplify.com/listenerEndpoint",
  "query": "eventType=testJobStateChangeEvent"
}
```

[R104] The Buyer/Client's Subscribe to Test Job Notifications request **MUST** include: [Mplify 136.1 R82]

- `callback`

If the Buyer/Client wishes to subscribe to 2 different types of events, there are 2 possible syntax variants [TMF630]:

```
eventType=testJobStateChangeEvent,testJobAttributeValueChangeEvent
```

or

```
eventType=testJobStateChangeEvent&eventType=testJobAttributeValueChangeEvent
```

The `query` formatting complies with RFC3986 RFC3986. According to it, every attribute defined in the Event model (from notification API) can be used in the `query`. However, this standard requires only `eventType` attribute to be supported.

The Seller/Server responds to the subscription request by adding the `id` of the subscription to the message that must be further used for unsubscribing.

```
{
  "id": "sub-001",
  "callback": "https://buyer.mplify.com/listenerEndpoint",
  "query": "eventType=testJobStateChangeEvent"
}
```

Example of a final address that the Notifications will be sent to (for `testJobStateChangeEvent`):

- `https://buyer.mplify.com/listenerEndpoint/mefApi/legato/serviceFunctionTestingNotification/v3/listener/testJobStateChangeEvent`

[R105] If successful, the Seller/Server response **MUST** indicate success and include the Register Notification Identifier and echo back all Buyer/Client provided attributes [Mplify 136.1 R83]

[R106] If successful, the Seller/Server **MUST** begin sending the appropriate notifications to the Buyer/Client. [Mplify 136.1 R84]

[R107] The Seller/Server **MUST NOT** send notifications if the Buyer/Client has not registered for them. [Mplify 136.1 R85]

[R108] If unsuccessful, the Seller/Server **MUST NOT** return a Register Notification Identifier. [Mplify 136.1 R86]

[R109] If the Seller/Server experiences any errors, they **MUST** return an error indication to the Buyer/Client. [Mplify 136.1 R87]

6.24. Use Case 24: Send Notification

Notifications are used to asynchronously inform the Buyer/Client about the respective objects and attributes changes.

Figure 52 presents notifications produced by Seller/Server for the whole lifecycle of `TestJob` assuming that Buyer/Client subscribed to all event types.

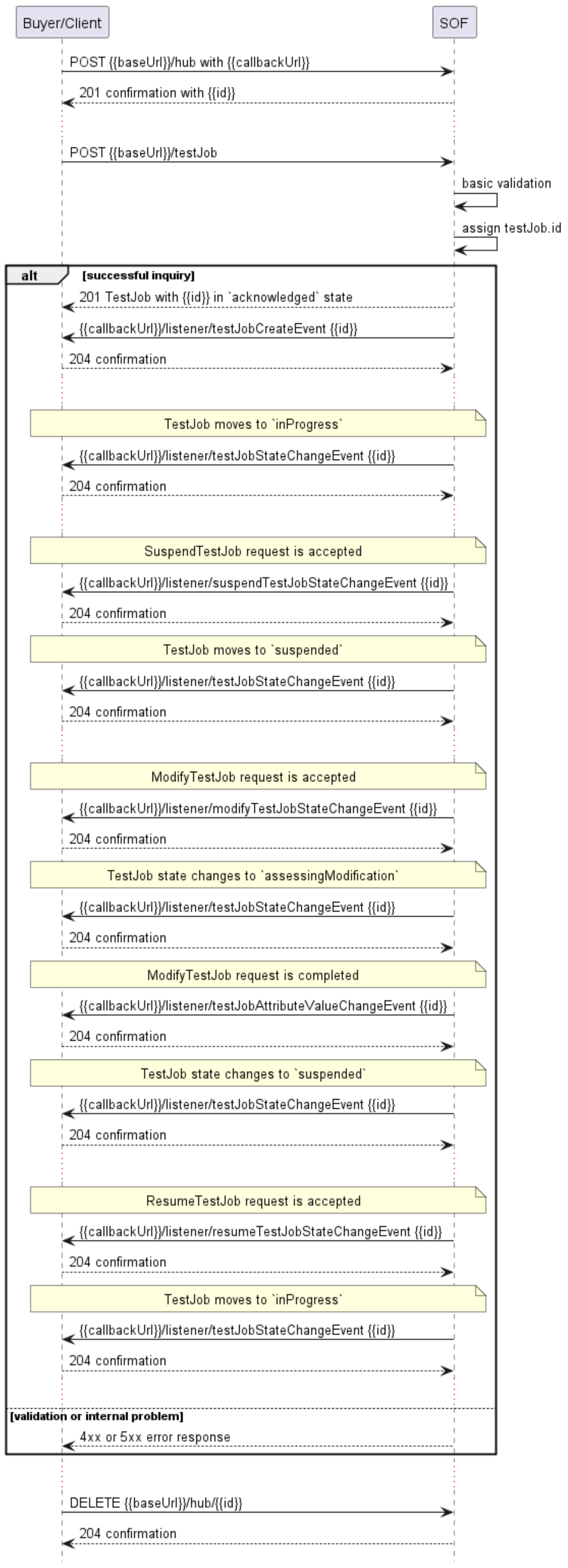

Buyer/Client
SOF
POST {{baseUrl}}/hub with {{callbackUrl}}
201 confirmation with {{id}}
POST {{baseUrl}}/testJob
basic validation
assign testJob.id
alt
[successful inquiry]
201 TestJob with {{id}} in `acknowledged` state
{{callbackUrl}}/listener/testJobCreateEvent {{id}}
204 confirmation
TestJob moves to `inProgress`
{{callbackUrl}}/listener/testJobStateChangeEvent {{id}}
204 confirmation
SuspendTestJob request is accepted
{{callbackUrl}}/listener/suspendTestJobStateChangeEvent {{id}}
204 confirmation
TestJob moves to `suspended`
{{callbackUrl}}/listener/testJobStateChangeEvent {{id}}
204 confirmation
ModifyTestJob request is accepted
{{callbackUrl}}/listener/modifyTestJobStateChangeEvent {{id}}
204 confirmation
TestJob state changes to `assessingModification`
{{callbackUrl}}/listener/testJobStateChangeEvent {{id}}
204 confirmation
ModifyTestJob request is completed
{{callbackUrl}}/listener/testJobAttributeValueChangeEvent {{id}}
204 confirmation
TestJob state changes to `suspended`
{{callbackUrl}}/listener/testJobStateChangeEvent {{id}}
204 confirmation
ResumeTestJob request is accepted
{{callbackUrl}}/listener/resumeTestJobStateChangeEvent {{id}}
204 confirmation
TestJob moves to `inProgress`
{{callbackUrl}}/listener/testJobStateChangeEvent {{id}}
204 confirmation
[validation or internal problem]
4xx or 5xx error response
DELETE {{baseUrl}}/hub/{{id}}
204 confirmation

Figure 52. Test Job lifecycle with all Notifications

After a successful notification subscription, the Seller/Server sends a `TestJob` create request. The SOF performs basic validation of the request, and if it passes, responds with the `TestJob` in the `acknowledged` state. The creation of the `TestJob` is then notified via a `testJobCreateEvent`.

Subsequently, the Seller/Server carries out additional business and time-consuming validations. If these validations are successful, the `TestJob` transitions to the `inProgress` state, and a corresponding `testJobStateChangeEvent` is triggered.

During the lifecycle of the Test Job, the following actions and corresponding notifications may occur:

- Suspension: When a suspend request is accepted, a `suspendTestJobStateChangeEvent` is sent, followed by a `testJobStateChangeEvent` indicating the `suspended` state.
- Modification: When a modify request is accepted, a `modifyTestJobStateChangeEvent` is sent, followed by a `testJobStateChangeEvent` indicating the `assessingModification` state. If attribute values are updated as a result, a `testJobAttributeValueChangeEvent` is issued. Once the modification is complete, the `TestJob` typically returns to the `suspended` state with a `testJobStateChangeEvent`.
- Resumption: When a resume request is accepted, a `resumeTestJobStateChangeEvent` is sent. The `TestJob` then moves back to `inProgress`, and a `testJobStateChangeEvent` is sent.

These notifications provide the Buyer/Client with real-time visibility into the state transitions and modifications of a `TestJob`.

The following snippets present an example of `testJobCreateEvent` and `testJobStateChangeEvent`.

```
{
  "eventId": "evt-001",
  "eventTime": "2025-06-13T14:45:00Z",
  "eventType": "testJobCreateEvent",
  "event": {
    "id": "job-12345",
    "href": "https://serverRoot/serviceFunctionTesting/v3/testJob/job-12345"
  }
}
```

```
{
  "eventId": "event-002",
  "eventType": "testJobStateChangeEvent",
  "eventTime": "204-01-15T20:45:24.796Z",
  "event": {
    "id": "job-12345",
    "href": "https://serverRoot/serviceFunctionTesting/v3/testJob/job-12345",
    "state": "acknowledged"
  }
}
```

Note: The state change notification is sent only when the state attribute changes its value.

[R110] The Seller/Server **MUST** include the following attributes in the Notification: [Mplify 136.1 R93]

- `eventId`
- `eventType`

- `eventTime`

[R111] The Seller/Server **MUST** send Notifications to the Buyer/Client that have registered for them.

[R112] The Seller/Server **MUST NOT** send Notifications to Buyer/Client that have not registered for them.

6.25. Use Case 25: Unregister for Notifications

To stop receiving events, the Buyer/Client has to use the `unregisterListener` operation from the `DELETE /hub/{id}` endpoint. The `id` is the identifier received from the Seller/Server during the listener registration.

[R113] If successful, the Seller/Server response **MUST** indicate success [Mplify 136.1 R89]

[R114] If successful, the Seller/Server **MUST** stop sending the appropriate notifications to the Buyer/Client. [Mplify 136.1 R90]

[R115] If unsuccessful, the Seller/Server **MUST NOT** stop sending the appropriate notifications to the Buyer/Client. [Mplify 136.1 R91]

[R116] If the Seller/Server experiences any errors, they **MUST** return an error indication to the Buyer/Client. [Mplify 136.1 R92]

7. API Details

7.1. API patterns

7.2. Indicating errors

Erroneous situations are indicated by appropriate HTTP responses. An error response is indicated by HTTP status 4xx (for client errors) or 5xx (for server errors) and appropriate response payload. The Address Validation API uses the error responses depicted and described below.

Implementations can use http error codes not specified in this standard in compliance with rules defined in [RFC7231]. In such case the error message body structure might be aligned with the `Error`.

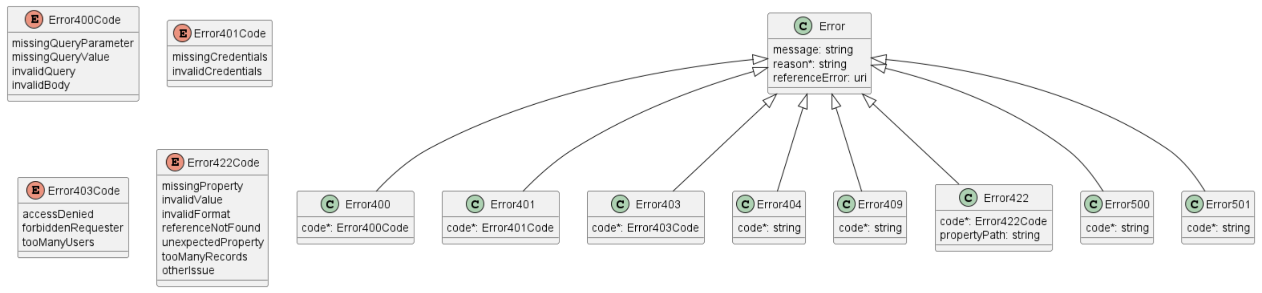


Figure 53. Data model types to represent an erroneous response

7.2.1. Type Error

Description: Standard Class used to describe API response error Not intended to be used directly. The `code` in the HTTP header is used as a discriminator for the type of error returned in runtime.

Name	Type	Description
message	string	Text that provides mode details and corrective actions related to the error. This can be shown to a client user.
reason*	string *maxLength = 255*	Text that explains the reason for the error. This can be shown to a client user.
referenceError	uri *format = uri*	URL pointing to documentation describing the error

7.2.2. Type Error400

Description: Bad Request. (https://tools.ietf.org/html/rfc7231#section-6.5.1)

Inherits from:

- Error

Name	Type	Description

Name	Type	Description
code*	Error400Code	One of the following error codes: - missingQueryParameter: The URI is missing a required query-string parameter - missingQueryValue: The URI is missing a required query-string parameter value - invalidQuery: The query section of the URI is invalid. - invalidBody: The request has an invalid body

7.2.3. `enum` Error400Code

Description: One of the following error codes:

- missingQueryParameter: The URI is missing a required query-string parameter
- missingQueryValue: The URI is missing a required query-string parameter value
- invalidQuery: The query section of the URI is invalid.
- invalidBody: The request has an invalid body

7.2.4. Type Error401

Description: Unauthorized. (https://tools.ietf.org/html/rfc7235#section-3.1)

Inherits from:

- Error

Name	Type	Description
code*	Error401Code	One of the following error codes: - missingCredentials: No credentials provided. - invalidCredentials: Provided credentials are invalid or expired

7.2.5. `enum` Error401Code

Description: One of the following error codes:

- missingCredentials: No credentials provided.
- invalidCredentials: Provided credentials are invalid or expired

7.2.6. Type Error403

Description: Forbidden. This code indicates that the server understood the request but refuses to authorize it. (https://tools.ietf.org/html/rfc7231#section-6.5.3)

Inherits from:

- Error

Name	Type	Description
code*	Error403Code	This code indicates that the server understood the request but refuses to authorize it because of one of the following error codes: - accessDenied: Access denied - forbiddenRequester: Forbidden requester - tooManyUsers: Too many users

7.2.7. `enum` Error403Code

Description: This code indicates that the server understood the request but refuses to authorize it because of one of the following error codes:

- accessDenied: Access denied
- forbiddenRequester: Forbidden requester
- tooManyUsers: Too many users

7.2.8. Type Error404

Description: Resource for the requested path not found. (https://tools.ietf.org/html/rfc7231#section-6.5.4)

Inherits from:

- Error

Name	Type	Description
code*	string	The following error code: - notFound: A current representation for the target resource not found

7.2.9. Type Error409

Description: Conflict (https://datatracker.ietf.org/doc/html/rfc7231#section-6.5.8)

Inherits from:

- Error

Name	Type	Description
code*	string	The following error code: - conflict: The client has provided a value whose semantics are not appropriate for the property.

7.2.10. Type Error422

The response for HTTP status `422` is a list of elements that are structured using the `Error422` data type. Each list item describes a business validation problem. This type introduces the `propertyPath` attribute which points to the erroneous property of the request, so that the Buyer may fix it easier. It is highly recommended that this property should be used, yet remains optional because it might be hard to implement.

Description: Unprocessable entity due to a business validation problem. (https://tools.ietf.org/html/rfc4918#section-11.2)

Inherits from:

- Error

Name	Type	Description

Name	Type	Description
code*	Error422Code	One of the following error codes: - missingProperty: The property the Seller has expected is not present in the payload - invalidValue: The property has an incorrect value - invalidFormat: The property value does not comply with the expected value format - referenceNotFound: The object referenced by the property cannot be identified in the Seller system - unexpectedProperty: Additional property, not expected by the Seller has been provided - tooManyRecords: the number of records to be provided in the response exceeds the Seller's threshold. - otherIssue: Other problem was identified (detailed information provided in a reason)
propertyPath	string	A pointer to a particular property of the payload that caused the validation issue. It is highly recommended that this property should be used. Defined using JavaScript Object Notation (JSON) Pointer (https://tools.ietf.org/html/rfc6901).

7.2.11. enum Error422Code

Description: One of the following error codes:

- missingProperty: The property the Seller has expected is not present in the payload
- invalidValue: The property has an incorrect value
- invalidFormat: The property value does not comply with the expected value format
- referenceNotFound: The object referenced by the property cannot be identified in the Seller system
- unexpectedProperty: Additional property, not expected by the Seller has been provided
- tooManyRecords: the number of records to be provided in the response exceeds the Seller's threshold.
- otherIssue: Other problem was identified (detailed information provided in a reason)

7.2.12. Type Error500

Description: Internal Server Error. (https://tools.ietf.org/html/rfc7231#section-6.6.1)

Inherits from:

- Error

Name	Type	Description
code*	string	The following error code: - internalError: Internal server error - the server encountered an unexpected condition that prevented it from fulfilling the request.

7.2.13. Type Error501

Description: Not Implemented. Used in case Seller is not supporting an optional operation (https://tools.ietf.org/html/rfc7231#section-6.6.2)

Inherits from:

- Error

Name	Type	Description
code*	string	The following error code: - notImplemented: Method not supported by the server

7.2.14. Type TerminationError

Description: This indicates an error that caused an Item to be terminated. The code and propertyPath should be used like in Error422.

Name	Type	Description
code	Error422Code	One of the following error codes: - missingProperty: The property the SOF has expected is not present in the payload - invalidValue: The property has an incorrect value - invalidFormat: The property value does not comply with the expected value format - referenceNotFound: The object referenced by the property cannot be identified in the SOF system - unexpectedProperty: Additional property, not expected by the SOF has been provided - tooManyRecords: the number of records to be provided in the response exceeds the SOF's threshold. - otherIssue: Other problem was identified (detailed information provided in a reason)
propertyPath	string	A pointer to a particular property of the payload that caused the validation issue. It is highly recommended that this property should be used. Defined using JavaScript Object Notation (JSON) Pointer (https://tools.ietf.org/html/rfc6901).
value	string	Text to describe the reason of the termination.

7.3. API Data model

7.3.1 Test Job

Figure 54 presents the Test Job data model. The data types, requirements related to them, and mapping to Mplify 136.1 specification are discussed later in this section.

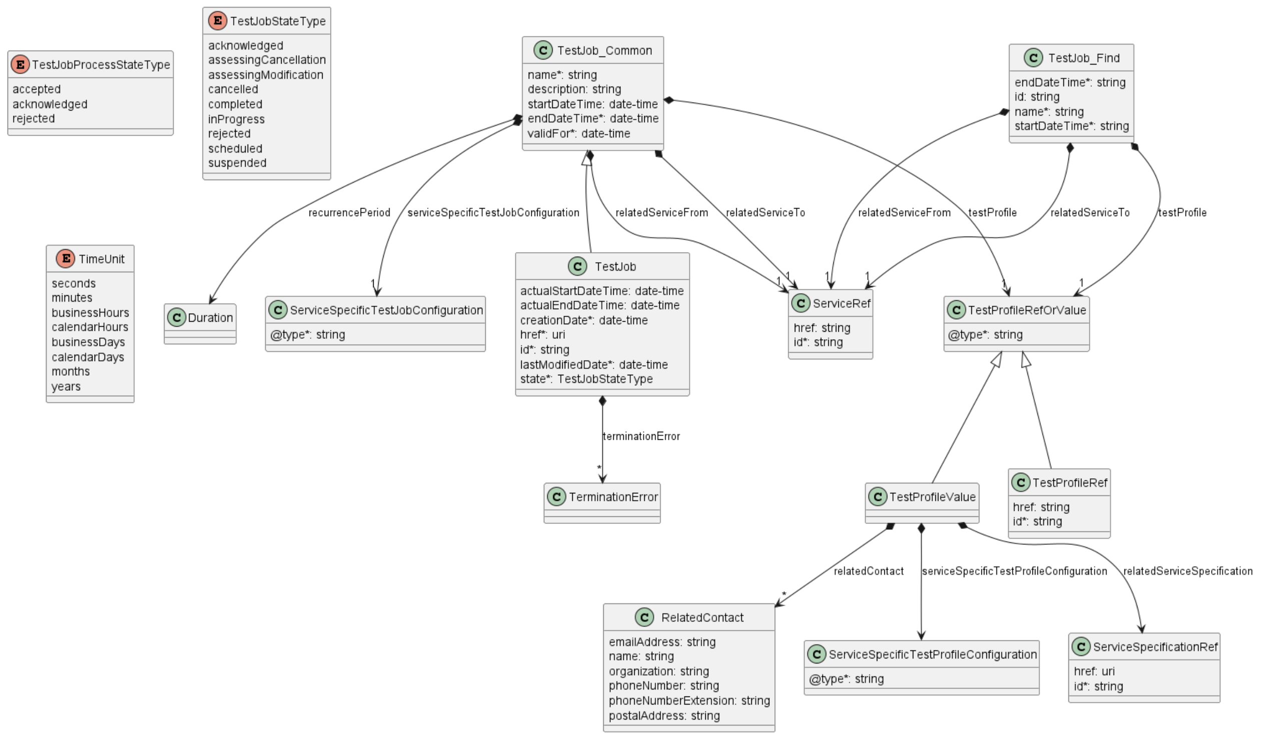


Figure 54. Test Job Data Model

7.3.1.1 Type TestJob

Description: A definition of Test Job for a specific Service Identifier.

Inherits from:

- TestJob_Common

Name	**Type**	**M/O**	**Description**	**Mplify 136.1**
actualStartDateTime	date-time *format = date-time*	O	The actual start date and time that a Test Job started.	Actual Start Date Time
actualEndDateTime	date-time *format = date-time*	O	The actual end date and time of the Test Job.	Actual End Date Time
creationDate	date-time *format = date-time*	M	Date when the Test Job was created.	Creation Date Time
href	uri *format = uri*	M	Hyperlink reference	
id	string	M	The identifier of the Test Job.	Test Job Identifier
lastModifiedDate	date-time *format = date-time*	M	Date when the job was last modified.	
state	TestJobStateType	M		Test Job State

Name	Type	M/O	Description	Mplify 136.1
terminationError	TerminationError[]	O	When the Seller/Server cannot process the request, the Seller/Server returns a text-based list of reasons here.	

7.3.1.2 Type TestJob_Common

Description: A definition of Test Job for a specific Service Identifier.

Name	Type	M/O	Description	Mplify 136.1
name	string	M	The name of the Test Job.	Test Job Name
description	string	O	A description of the Test Job.	Test Job Description
requestedStartDateTime	date-time *format = date-time*	O	The start date and time of the Test Job. If the Buyer desires to schedule a test, this is a future date/time. If the Buyer desires an immediate test, this is empty.	Start Date Time
requestedEndDateTime	date-time *format = date-time*	M	The end date and time of the Test Job.	End Date Time
recurrencePeriod	Duration	O		Recurrence Period
testProfile	TestProfileRefOrValue	M		
relatedServiceFrom	ServiceRef	M		Service ID From
relatedServiceTo	ServiceRef	M		Service ID To
serviceSpecificTestJob Configuration	ServiceSpecificTestJob Configuration	M		Service Specific Test Job Configuration

7.3.1.3 Type TestJob_Find

Description: This class represents a single list item for the response of `listTestJob`

Name	Type	M/O	Description	Mplify 136.1
requestedEndDateTime	string	M	The end date and time of the Test Job.	End Date Time

Name	Type	M/O	Description	Mplify 136.1
id	string	O	A unique identifier for the Test Job assigned by the Seller/Server.	Test Job Identifier
name	string	M	The name of the Test Job..	Test Job Name
relatedServiceFrom	ServiceRef	M		Service ID From
relatedServiceTo	ServiceRef	M		Service ID To
requestedStartDateTime	string	M	The start date and time of the Test Job.	Start Date Time
testProfile	TestProfile RefOrValue	M		r

7.3.1.4 Type TestJobRef

Description: A reference to a Test Job resource

Name	Type	M/O	Description	Mplify 136.1
href	string	O	Hyperlink to the referenced Test Job	
id	string	M	Identifier of the referenced Test Job	Test Job Identifier

7.3.1.5 `enum` TestJobStateType

Description: The state of the Test Job.

State	Mplify 136.1 name	Description

State	Mplify 136.1 name	Description
`acknowledged`	ACKNOWLEDGED	The Create Test Job request has been received from the Buyer/Client and the Seller/Server has assigned a Test Job Identifier to it. If the request attributes fail validation, the Create Test Job moves to the REJECTED state. If the attributes pass validation, it is then determined if the Create Test Job Start Date Time is immediate or if the Create Test Job Start Date Time indicates that the Test Job is to be scheduled for a later date time. If the Test Job is to be scheduled the Test Job moves to the SCHEDULED state and awaits the scheduled date and time. If the Test Job is to be performed immediately, the Test Job moves to the IN_PROGRESS state and Test Results begin.
`assessingCancellation`	ASSESSING_CANCELLATION	A Cancel Test Job request is received while the Test Job is in the IN_PROGRESS, SUSPENDED or SCHEDULED state. If the Cancel Test Job request is approved, the Test Job moves to the CANCELLED state. If not, the Test Job returns to the IN_PROGRESS, SUSPENDED or SCHEDULED state.
`assessingModification`	ASSESSING_MODIFICATION	A Modify Test Job request was received while the Test Job is in the SUSPENDED or SCHEDULED state. If the Modify Test Job is accepted, the Test Job is updated. If the Modify Test Job is declined, the Test Job is not updated and returns to the SUSPENDED or SCHEDULED state.
`cancelled`	CANCELLED	A Cancel Test Job request is received from the Buyer/Client. If the request is accepted, the Test Job moves to the CANCELLED state. The Test Job must be in the IN_PROGRESS, SCHEDULED, or SUSPENDED, state.

State	Mplify 136.1 name	Description
`completed`	COMPLETED	The Test Job has reached the End Date Time or has completed all Test Measurements and provided Test Results.
`inProgress`	IN_PROGRESS	Whether an immediate request or a scheduled request, the Test Job moves to the IN_PROGRESS state when it begins performing Test Results. If a Cancel Test Job request is received and accepted, the Test Job moves to the CANCELLED state. If the Cancel Test Job request is declined, the Test Job returns to the IN_PROGRESS state and continues Test Results until they are completed. If a Suspend Test Job request is received, the Test Job moves to the SUSPENDED state.
`rejected`	REJECTED	The Create Test Job request fails validation and is rejected.
`scheduled`	SCHEDULED	The Test Job is scheduled to start at a later time. The Test Job stays in the SCHEDULED state until the Start Date and Time is reached. The Test Job moves to IN_PROGRESS when the Start Date and Time is reached. A Test Job with the state SCHEDULED can be moved to the SUSPENDED or CANCELLED state.
`suspended`	SUSPENDED	A Test Job in the IN_PROGRESS or SCHEDULED state receives a Suspend Test Job request. The Test Job moves to the SUSPENDED state.

7.3.1.6 Type ServiceSpecificTestJobConfiguration

Description: ServiceSpecificTestJobConfiguration is used as an extension point for schema to be used that defines the Test Measure attributes. The `@type` attribute is used as a discriminator.

Name	Type	M/O	Description	Mplify 136.1
@type	string	M	The named type must be a subclass of ServiceSpecificTestJobConfiguration.	

7.3.1.7 Type RelatedContact

Description:

Name	Type	M/O	Description	Mplify 136.1
emailAddress	string	O	The email address for this contact.	Contact Email Address
name	string	O	The name of person or organization to be contacted.	Contact Name
organization	string	O	The organization of this contact.	Contact Organization
phoneNumber	string	O	The telephone number for this contact.	Contact Phone Number
phoneNumberExtension	string	O	The telephone number extension for this contact.	Contact Phone Number Extension
postalAddress	string	O	The postal address for this contact.	Contact Postal Address

7.3.1.8 Type ServiceRef

Description: Reference to a Service instance.

Name	Type	M/O	Description	Mplify 136.1
href	string	O	Hyperlink reference to Service	
id	string	M	unique identifier of Service	

7.3.1.9 Type ServiceSpecificationRef

Description:

Name	Type	M/O	Description	Mplify 136.1
href	uri *format = uri*	O	Hyperlink reference to the Service Specification	
id	string	M	The unique identifier of the related Service Specification that this Test Profile can be used to test	Related Service Specification Identifier

7.3.1.10 Type Duration

Description: A Duration in a given unit of time e.g. 3 hours, or 5 days.

Name	Type	M/O	Description	Mplify 136.1
amount	integer *minimum = 0*	M	Duration (number of seconds, minutes, hours, etc.)	
units	TimeUnit	M	Time unit enumerated	

7.3.1.11 `enum` TimeUnit

Description: Represents a unit of time.

Value
seconds
minutes
businessHours
calendarHours
businessDays
calendarDays
months
years

7.3.2 Test Job Process

Figure 54 presents the Test Job Process data model. The data types, requirements related to them, and mapping to Mplify 136.1 specification are discussed later in this section.

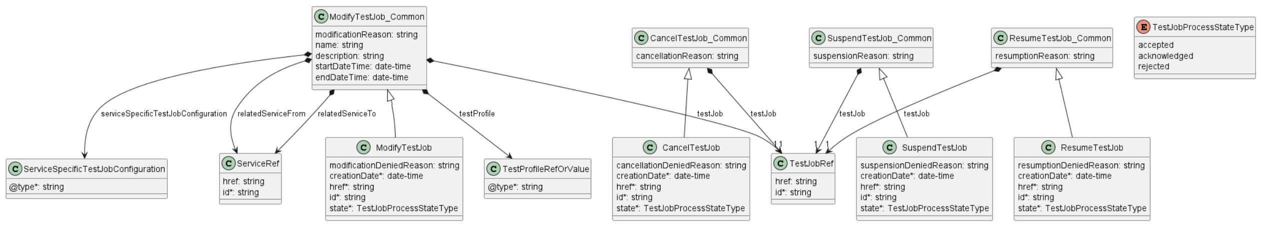


Figure 55. Test Job Process Data Model

7.3.2.1 `enum` TestJobProcessStateType

Description: The state of process related to Test Job

state	Mplify 136.1 name	Description
`accepted`	ACCEPTED	The Modify/Cancel/Resume/Suspend Test Job request has been accepted and processed by the Seller/Server.
`acknowledged`	ACKNOWLEDGED	The Modify/Cancel/Resume/Suspend Test Job request has been received by the Seller/Server and has passed basic validation. Test Job Process Identifier is assigned in the Acknowledged state. The request remains in the Acknowledged state until all validations as applicable are completed. If the attributes are validated, the request moves to the Accepted state. If not all attributes are validated, the request moves to the Rejected state.
`rejected`	REJECTED	The Modify/Cancel/Resume/Suspend Test Job request has been rejected by the Seller/Server.

7.3.2.2 Type CancelTestJob

Description: Request for cancellation of an existing Test job

Inherits from:

- CancelTestJob_Common

Name	Type	M/O	Description	Mplify 136.1
cancellationDeniedReason	string	O	If the Cancel Test Job request is denied by the Seller/Server, the Seller/Server provides a reason to the Buyer/Client using this attribute.	
creationDate	date-time *format = date-time*	M	Date when Cancel Test Job was created.	
href	string	M	Hyperlink to the Cancel Test Job entity	
id	string	M	Unique identifier for the Cancel Test Job that is generated by the Seller/Server when the Cancel Test Job request `state` is set to `acknowledged`.	Cancel Test Job Identifier
state	TestJob ProcessStateType	M		Cancel Test Job State

7.3.2.3 Type CancelTestJob_Common

Description: Request for cancellation of an existing Test Job

Name	Type	M/O	Description	Mplify 136.1
cancellationReason	string	O	An optional attribute that allows the Buyer/Client to provide additional detail to the Seller/Server on the reason for cancelling Test Job.	
testJob	TestJobRef	M		

7.3.2.4 Type ModifyTestJob

Description: Request for modification of an existing Test job

Inherits from:

- ModifyTestJob_Common

Name	Type	M/O	Description	Mplify 136.1

Name	Type	M/O	Description	Mplify 136.1
modificationDeniedReason	string	O	If the Modify Test Job request is denied by the Seller/Server, the Seller/Server provides a reason to the Buyer/Client using this attribute.	
creationDate	date-time *format = date-time*	M	Date when Modify Test Job was created.	
href	string	M	Hyperlink to the Modify Test Job entity	
id	string	M	Unique identifier for the Modify Test Job that is generated by the Seller/Server when the Modify Test Job request `state` is set to `acknowledged`.	Modify Test Job Identifier
state	TestJob ProcessStateType	M		Modify Test Job State

7.3.2.5 Type ModifyTestJob_Common

Description: Request for modification of an existing Test Job

Name	Type	M/O	Description	Mplify 136.1
modificationReason	string	O	An optional attribute that allows the Buyer/Client to provide additional detail to the Seller/Server on the reason for cancelling Test Job.	
testJob	TestJobRef	M		
name	string	O	The name of the Test Job.	Test Job Name
description	string	O	A description of the Test Job.	Test Job Description
requestedStartDateTime	date-time *format = date-time*	O	The start date and time of the Test Job. If the attribute is empty the Test Jobs starts immediately.	Start Date Time

Name	Type	M/O	Description	Mplify 136.1
requestedEndDateTime	date-time *format = date-time*	O	The end date and time of the Test Job. If the attribute is empty the Test Job runs forever.	End Date Time
testProfile	TestProfileRefOrValue	O		
relatedServiceFrom	ServiceRef	O		Service ID From
relatedServiceTo	ServiceRef	O		Service ID To
serviceSpecificTestJob Configuration	ServiceSpecificTestJob Configuration	O		Test Specific Configuration

7.3.2.6 Type ResumeTestJob

Description: Request for resumption of an existing Test job

Inherits from:

- ResumeTestJob_Common

Name	Type	M/O	Description	Mplify 136.1
resumption DeniedReason	string	O	If the Resume Test Job request is denied by the Seller/Server, the Seller/Server provides a reason to the Buyer/Client using this attribute.	
creationDate	date-time *format = date-time*	M	Date when Resume Test Job was created.	
href	string	M	Hyperlink to the Resume Test Job entity	
id	string	M	Unique identifier for the Resume Test Job that is generated by the Seller/Server when the Resume Test Job request `state` is set to `acknowledged`.	Resume Test Job Identifier
state	TestJob ProcessStateType	M		Resume Test Job State

7.3.2.7 Type ResumeTestJob_Common

Description: Request for resumption of an existing Test Job

Name	Type	M/O	Description	Mplify 136.1
resumptionReason	string	O	An optional attribute that allows the Buyer/Client to provide additional detail to the Seller/Server on the reason for cancelling Test Job.	

Name	Type	M/O	Description	Mplify 136.1
testJob	TestJobRef	M		

7.3.2.8 Type SuspendTestJob

Description: Request for suspension of an existing Test job

Inherits from:

- SuspendTestJob_Common

Name	Type	M/O	Description	Mplify 136.1
suspension DeniedReason	string	O	If the Suspend Test Job request is denied by the Seller/Server, the Seller/Server provides a reason to the Buyer/Client using this attribute.	
creationDate	date-time *format = date-time*	M	Date when Suspend Test Job was created.	
href	string	M	Hyperlink to the Suspend Test Job entity	
id	string	M	Unique identifier for the Suspend Test Job that is generated by the Seller/Server when the Suspend Test Job request `state` is set to `acknowledged`.	Suspend Test Job Identifier
state	TestJob ProcessStateType	M		Suspend Test Job State

7.3.2.9 Type SuspendTestJob_Common

Description: Request for suspension of an existing Test Job

Name	Type	M/O	Description	Mplify 136.1
suspensionReason	string	O	An optional attribute that allows the Buyer/Client to provide additional detail to the Seller/Server on the reason for suspending Test Job.	
testJob	TestJobRef	M		

7.3.3 Test Profile

Figure 55 presents the whole Test Profile data model. The data types, requirements related to them, and mapping to Mplify 136.1 specification are discussed later in this section.

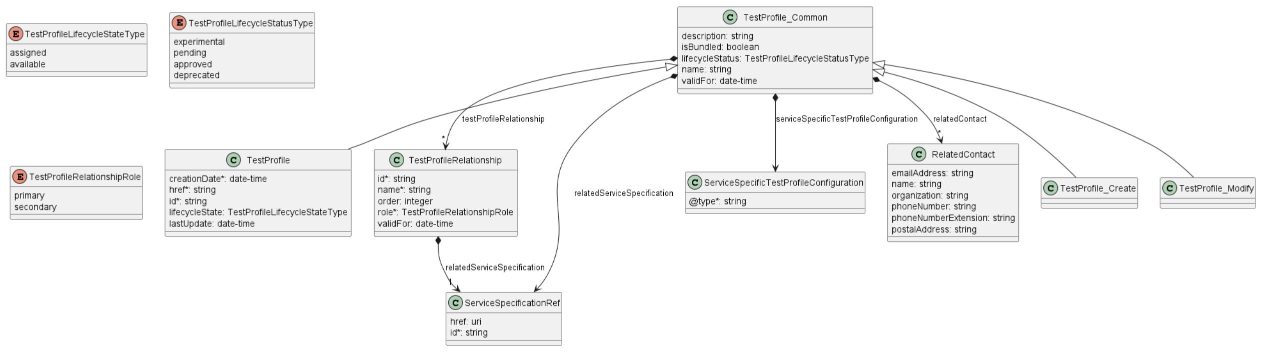


Figure 56. Test Profile Data Model

7.3.3.1 Type TestProfile

Description: Detailed specification that includes the Test Job attributes and Service Specifications that are specified to be tested by this Test Profile.

Inherits from:

- TestProfile_Common

7.3.3.2 Type TestProfile_Common

Description: Detailed specification that includes the Test Job attributes and Service Specifications that are specified to be tested by this Test Profile.

Name	**Type**	**M/O**	**Description**	**Mplify 136.1**
description	string	O	A free-text description of the Test Profile	Description
isBundled	boolean	O	Determines whether specification represents a single Test Profile (false), or a bundle of Test Profiles (true). For atomic Test Profiles this is always set to false.	Is Bundled
lifecycleStatus	TestProfileLifecycleStatusType	O		Lifecycle Status
name	string	O	The name of the Test Profile	Test Profile Name
validFor	date-time *format = date-time*	O	Last date that the Test Profile is valid	Valid For

Name	Type	M/O	Description	Mplify 136.1
testProfile Relationship	TestProfile Relationship[]	O	Test profile may relate to more than one sub Test Profiles.	Test Profile Relationship
serviceSpecific TestProfileConfiguration	ServiceSpecific TestProfileConfiguration	O		Service Specific Test Profile Configuration
relatedService Specification	Service SpecificationRef	O		
relatedContact	RelatedContact[]	O	Contacts who manage or otherwise have an interest in this Test Profile	Related Contact Information

7.3.3.3 Type TestProfile_Create

Description: Detailed specification that includes the Test Job attributes and Service Specifications that are specified to be tested by this Test Profile. This type is used in the request.

Inherits from:

- TestProfile_Common

7.3.3.4 Type TestProfile_Modify

Description: Detailed specification that includes the Test Job attributes and Service Specifications that are specified to be tested by this Test Profile. This type is used in the request.

Inherits from:

- TestProfile_Common

7.3.3.5 `enum` TestProfileLifecycleStatusType

Description: Current lifecycle status of the Test Profile.

Status	Mplify 136.1 name	Description
`experimental`	EXPERIMENTAL	Test Profile use may be limited to a small number of users.
`pending`	PENDING	Test Profile is waiting to be Approved
`approved`	APPROVED	Test Profile has been Approved for general use.
`deprecated`	DEPRECATED	Test Profile has been replaced by another Test Profile.

7.3.3.6 Type TestProfileRef

Description: A reference to a Test Profile resource

Inherits from:

- TestProfileRefOrValue

Name	Type	M/O	Description	Mplify 136.1
href	string	O	Hyperlink to the referenced Test Profile	
id	string	M	Identifier of the referenced Test Profile	Test Profile Identifier

7.3.3.7 Type TestProfileRefOrValue

Description: Defines the reference to Test Profile or defines values from TestProfile type.

Name	Type	M/O	Description	Mplify 136.1
@type	string	M	This field is used as a discriminator to differentiate if object relates directly to Test Profile entity or defines values from TestProfile type.	

7.3.3.8 `enum` TestProfileRelationshipRole

Description: Role of the relationship.

role	Mplify 136.1 name	Description
`primary`	PRIMARY	Test Profile to be started first.
`secondary`	SECONDARY	Test Profile to be started after Primary Test Profile is completed.

7.3.3.9 Type TestProfileRelationship

Description:

Name	Type	M/O	Description	Mplify 136.1
id	string	M	The unique identifier for a related Test Profile	Test Profile Relationship Identifier
name	string	M	The unique name for a related Test Profile	Test Profile Relationship Name
order	integer	O	The order which the related Test Jobs are run during a Test Job	Test Profile Relationship Order
relatedServiceSpecification	ServiceSpecificationRef	M		
role	TestProfileRelationshipRole	M		Related Test Profile Role

Name	Type	M/O	Description	Mplify 136.1
validFor	date-time *format = date-time*	O	The last date that the Test Profile is valid.	Test Profile Relationship Valid For

7.3.3.10 `enum` TestProfileLifecycleStateType

Description: Current lifecycle status of the Test Profile.

State	Mplify 136.1 name	Description
`assigned`	ASSIGNED	The Test Profile has been assigned to a Test Job.
`available`	AVAILABLE	The Test Profile has been created or modified and is ready for users to specify in a Test Job.

7.3.3.11 Type TestProfileValue

Description: Direct assignment of values defined by TestProfile type to TestJob object. Necessary when TestJob is created without reference to TestProfile.

Inherits from:

- TestProfileRefOrValue

Name	Type	M/O	Description	Mplify 136.1
serviceSpecific TestProfileConfiguration	ServiceSpecific TestProfileConfiguration	O		Service Specific Test Profile Configuration
relatedService Specification	Service SpecificationRef	O		Related Service Specification Identifier
relatedContact	RelatedContact[]	O	Contacts who manage or otherwise have an interest in this Test Profile	Related Contact Information

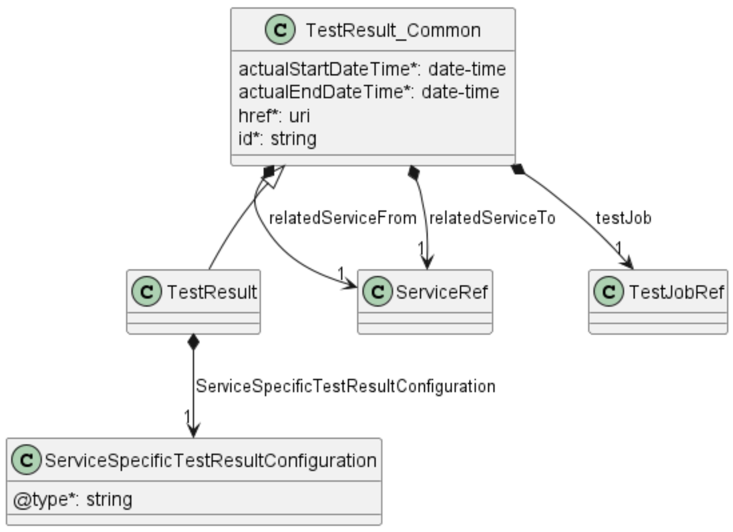
7.3.3.12 Type ServiceSpecificTestProfileConfiguration

Description: ServiceSpecificTestProfileConfiguration is used as an extension point for for schema that define how a test is performed for a given Test Specification. The `@type` attribute is used as a discriminator.

Name	Type	M/O	Description	Mplify 136.1
@type	string	M	The named type must be a subclass of ServiceSpecificTestProfileConfiguration.	

7.3.4 Test Result

Figure 56 presents the whole Test Result data model. The data types, requirements related to them, and mapping to Mplify 136.1 specification are discussed later in this section.



TestResult_Common
actualStartDateTime*: date-time
actualEndDateTime*: date-time
href*: uri
id*: string
relatedServiceFrom
relatedServiceTo
testJob
1
TestResult
ServiceRef
TestJobRef
ServiceSpecificTestResultConfiguration
ServiceSpecificTestResultConfiguration
@type*: string

Figure 57. Test Result Data Model

7.3.4.1 Type TestResult

Description: The execution of a Test Job creates Test Result that provide Buyer/Client with the results of the Job.

Inherits from:

- TestResult_Common

Name	Type	M/O	Description
ServiceSpecificTestResultConfiguration	ServiceSpecificTestResultConfiguration	M	

7.3.4.2 Type TestResult_Common

Description: The execution of a Test Job creates Test Result that provide Buyer/Client with the results of the Job.

Name	Type	M/O	Description	Mplify 136.1
actualStartDateTime	date-time *format = date-time*	M	The actual start date and time of the Test Result for a given Test Job.	Actual Start Date Time
actualEndDateTime	date-time *format = date-time*	M	The actual end date and time of the Test Result for a given Test Job.	Actual End Date Time
href	uri *format = uri*	M	Hyperlink reference	
id	string	M	A unique identifier for the Test Result assigned by the Seller/Server.	Test Result Identifier

Name	Type	M/O	Description	Mplify 136.1
relatedServiceFrom	ServiceRef	M		Service ID From
relatedServiceTo	ServiceRef	M		Service ID To
testJob	TestJobRef	M		Test Job Identifier

7.3.4.3 Type ServiceSpecificTestResultConfiguration

Description: ServiceSpecificTestResultConfiguration is used as an extension point for schema to be used that defines the Test Result attributes. The `@type` attribute is used as a discriminator.

Name	Type	M/O	Description	Mplify 136.1
@type	string	M	The named type must be a subclass of ServiceSpecificTestJobResult.	

7.3.5. Notification registration

Notification registration and management are done through `/hub` API endpoint. The below sections describe data models related to this endpoint.

7.3.5.1. Type EventSubscriptionInput

Description: This class is used to register for Notifications.

Name	Type	M/O	Description
callback	string	M	This callback value must be set to *host* property from SFT Notification API (serviceFunctionTestNotification.api.yaml). This property is appended with the base path and notification resource path specified in that API to construct an URL to which notification is sent. E.g. for 'callback': "https://buyer.mplify.com/listenerEndpoint", the SFT event notification will be sent to: `https://buyer.mplify.com/listenerEndpoint /mefApi/legato/serviceFunctionTestingNotification/v3/`
query	string	O	This attribute is used to define to which type of events to register to. Example: 'query':'eventType = testJobCreateEvent'. To subscribe for more than one event type, put the values separated by comma: `eventType=testJobCreateEvent, testProfileAttributeValueChangeEvent`. The possible values are enumerated by 'TestProfileEventType' and TestJobEventType in serviceFunctionTestNotification.api.yaml. An empty query is treated as specifying no filters - ending in subscription for all event types.

7.3.5.2. Type EventSubscription

Description: This resource is used to respond to notification subscriptions.

Inherits from:

- EventSubscriptionInput

Name	Type	M/O	Description
id	string	O	An identifier of this Event Subscription assigned when a resource is created.

7.4 Notification API Data model

This data model is used to construct requests and responses of the API endpoints described in 5.2.2. Buyer/Client (CUS, BUS, SOF) side Service Function Testing API Endpoints

7.4.1 Test Job Notification API Data model

Figure 58. presents the Test Job Notification data model.

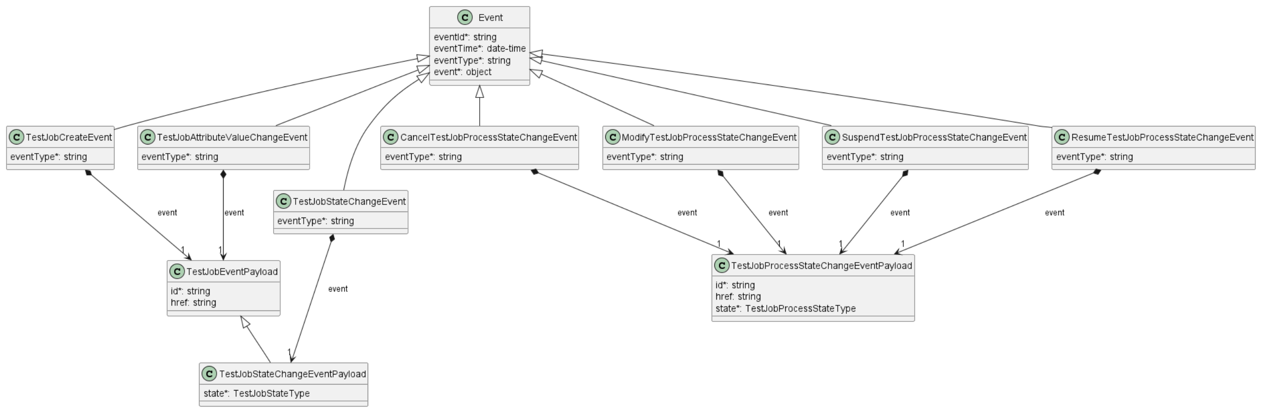


Figure 58. Test Job Data Model

7.4.1.1 Type Event

Description: Event class is used to describe information structure used for notification.

Name	Type	M/O	Description
eventId	string	M	Id of the event
eventTime	date-time *format = date-time*	M	Date-time when the event occurred
eventType	string	M	The type of the notification.
event	object	M	The event linked to the involved resource object

7.4.1.2 Type CancelTestJobProcessStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobProcessEventPayload	M	A reference to the object that is source of the notification.

7.4.1.3 Type ModifyTestJobProcessStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobProcessEventPayload	M	A reference to the object that is source of the notification.

7.4.1.4. Type ResumeTestJobProcessStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobProcessEventPayload	M	A reference to the object that is source of the notification.

7.4.1.5. Type SuspendTestJobProcessStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobProcessEventPayload	M	A reference to the object that is source of the notification.

7.4.1.6 Type TestJobAttributeValueChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobEventPayload	M	A reference to the object that is source of the notification.

7.4.1.7 Type TestJobCreateEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobEventPayload	M	A reference to the object that is source of the notification.

7.4.1.8 Type TestJobEventPayload

Description: The identifier of the Test Job being subject of this event.

Name	Type	M/O	Description
id	string	M	ID of the Test Job
href	string	O	Hyperlink to access the Test Job

7.4.1.9 `enum` TestJobProcessStateType

Description: The state of process related to Test Job

state	Mplify 136.1 name	Description
`accepted`	ACCEPTED	The Modify/Cancel/Resume/Suspend Test Job request has been accepted and processed by the Seller/Server.
`acknowledged`	ACKNOWLEDGED	The Modify/Cancel/Resume/Suspend Test Job request has been received by the Seller/Server and has passed basic validation. Test Job Process Identifier is assigned in the Acknowledged state. The request remains in the Acknowledged state until all validations as applicable are completed. If the attributes are validated, the request moves to the Accepted state. If not all attributes are validated, the request moves to the Rejected state.
`rejected`	REJECTED	The Modify/Cancel/Resume/Suspend Test Job request has been rejected by the Seller/Server.

7.4.1.10 Type TestJobStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestJobStateChangeEventPayload	M	A reference to the object that is source of the notification.

7.4.1.11 Type TestJobStateChangeEventPayload

Description:

Inherits from:

- TestJobEventPayload

7.4.1.12 Type TestJobProcessEventPayload

Description: The identifier of the Test Job Process being subject of this event.

Name	Type	M/O	Description
id	string	M	ID of the Test Job Process
href	string	O	Hyperlink to access the Test Job Process
state	TestJob ProcessStateType	M	The current state of the Test Job Process

7.4.2 Test Profile Notification API Data model

Figure 59. presents the Test Profile Notification data model.

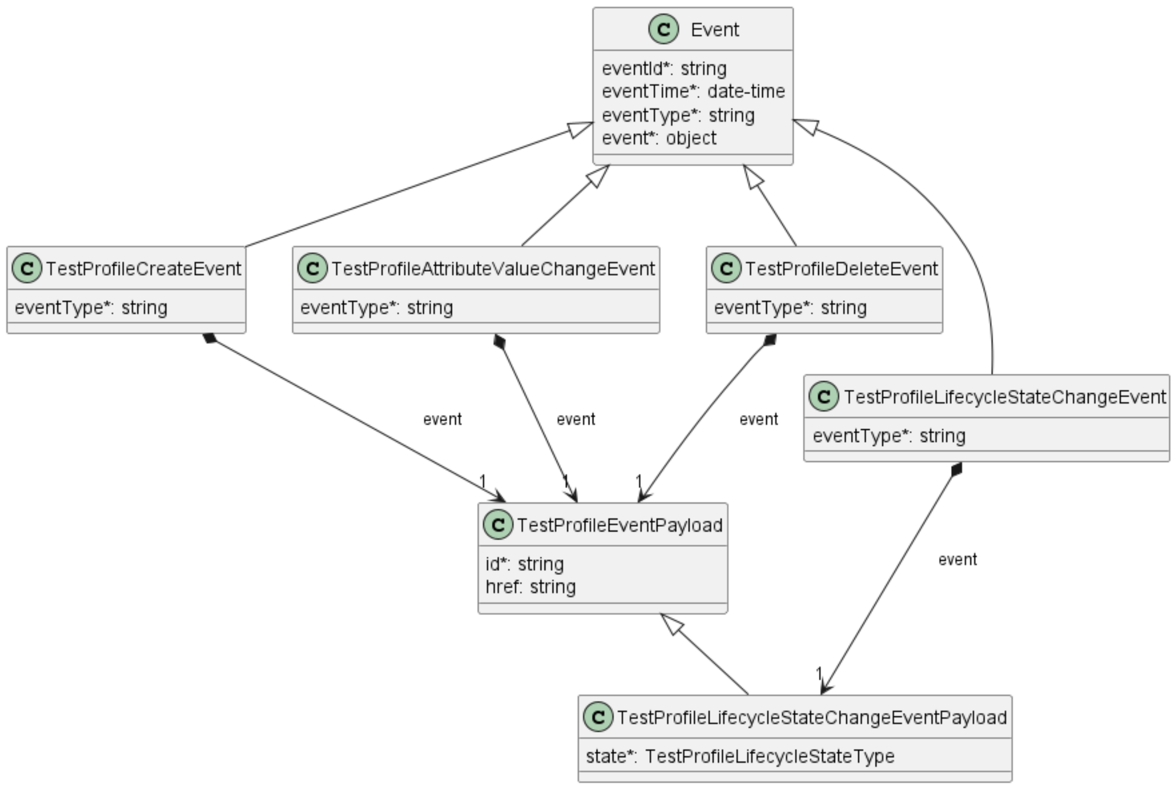


Figure 59. Test Profile Notification Data Model

7.4.2.1 Type TestProfileAttributeValueChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestProfileEventPayload	M	A reference to the object that is source of the notification.

7.4.2.2 Type TestProfileCreateEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestProfileEventPayload	M	A reference to the object that is source of the notification.

7.4.2.3 Type TestProfileDeleteEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestProfileEventPayload	M	A reference to the object that is source of the notification.

7.4.2.4 Type TestProfileEventPayload

Description: The identifier of the Test Profile being subject of this event.

Name	Type	M/O	Description
id	string	M	ID of the Test Profile
href	string	O	Hyperlink to access the Test Profile

7.4.2.5 Type TestProfileLifecycleStateChangeEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestProfileLifecycleStateChangeEventPayload	M	A reference to the object that is source of the notification.

7.4.2.6 Type TestProfileLifecycleStateChangeEventPayload

Description:

Inherits from:

- TestProfileEventPayload

7.4.3 Test Result Notification API Data model

Figure 60. presents the Test Result Notification data model.

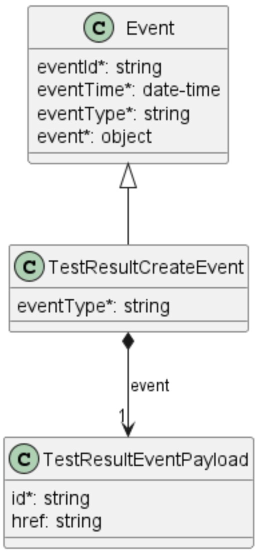


Figure 60. Test Result Notification Data Model

7.4.3.1 Type TestResultCreateEvent

Description:

Inherits from:

- Event

Name	Type	M/O	Description
eventType	string	M	Indicates the type of the event.
event	TestResultEventPayload	M	A reference to the object that is source of the notification.

7.4.3.2 Type TestResultEventPayload

Description: The identifier of the Test Result being subject of this event.

Name	Type	M/O	Description
id	string	M	ID of the Test Result
href	string	O	Hyperlink to access the Test Result

8. References

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