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SERIES M: TELECOMMUNICATION MANAGEMENT, INCLUDING TMN AND NETWORK MAINTENANCE

Telecommunications management network

Requirements for service and product lifecycle management across business to business interfaces

Recommendation ITU-T M.3349

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Recommendation ITU-T M.3349

Requirements for service and product lifecycle management across business to business interfaces

Summary

Recommendation ITU-T M.3349 describes the requirements for service and product lifecycle management across business to business interfaces in support of next generation networks. The requirements are provided using the TMN interface specification methodology described in Recommendation ITU-T M.3020.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T M.3349	2013-03-16	2

Keywords

NGN, product, requirement, service, service customer, service provider, supplier/partner.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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Introduction

ITU-T has defined the architecture and general principles of next generation networks (NGN). Next generation networks are essentially about delivering new services. The open architecture of NGNs will enable the creation of new services to be easier and quicker. The service provider can either provide services and products by itself, or assemble services and products provided by its suppliers and partners. The supply chain will become more complex in an NGN environment. During service and product lifecycle management, the interaction between the service provider and its suppliers and partners will be more frequent and more important.

This Recommendation contains the requirements for service and product lifecycle management across business to business interfaces in support of NGNs

Recommendation ITU-T M.3349

Requirements for service and product lifecycle management across business to business interfaces

1 Scope

This Recommendation contains the requirements for service and product lifecycle management across business to business interfaces in support of NGNs. In general, the lifecycle of services and products includes development, negotiation and sales, implementation, execution, assessment, and decommission phases (See [ITU-T M.3050.3]). In this Recommendation, the interface focuses only on the interactions between a service provider and its suppliers and partners. In each phase, the exchange of service and product information is required between the service provider and its suppliers and partners across business to business (B2B) interfaces. This Recommendation focuses on the requirements of B2B interfaces which cover all of these phases. The requirements are provided using the TMN interface specification methodology described in [ITU-T M.3020].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.3010] Recommendation ITU-T M.3010 (2000), *Principles for a telecommunications management network*.

[ITU-T M.3020] Recommendation ITU-T M.3020 (2011), *Management interface specification methodology*.

[ITU-T M.3050.1] Recommendation ITU-T M.3050.1 (2007), *Enhanced Telecom Operations Map (eTOM) – The business process framework*.

[ITU-T M.3050.3] Recommendation ITU-T M.3050.3 (2007), *Enhanced Telecom Operations Map (eTOM) –Representative process flows*.

[ITU-T M.3060] Recommendation ITU-T M.3060/Y.2401 (2006), *Principles for the Management of Next Generation Networks*.

[ITU-T M.3190] Recommendation ITU-T M.3190 (2008), *Shared information and data model (SID)*.

[ITU-T M.3320] Recommendation ITU-T M.3320 (1997), *Management requirements framework for the TMN X-Interface*.

[ITU-T M.3343] Recommendation ITU-T M.3343 (2007), *Requirements and analysis for NGN trouble administration across B2B and C2B interfaces*.

[ITU-T M.3400] Recommendation ITU-T M.3400 (2000), *TMN management functions*.

[ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 interface [ITU-T M.3010]

3.1.2 network operator [ITU-T M.3343]

3.1.3 next generation network (NGN) [ITU-T Y.2001]

3.1.4 partner [ITU-T M.3050.1]

3.1.5 product [ITU-T M.3050.1]

3.1.6 service [ITU-T M.3050.1]

3.1.7 service customer [ITU-T M.3320]

3.1.8 service provider [ITU-T M.3320]

3.1.9 supplier [ITU-T M.3050.1]

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

B2B Business to Business

NGN Next Generation Network

SC Service Customer

SLA Service Level Agreement

SP Service Provider

P/S Partner/Supplier

TMN Telecommunications Management Network

5 Conventions

In this Recommendation, mandatory requirements are indicated by use of the word "shall". Desirable requirements are indicated by the use of the word "should". Optional requirements are indicated by the use of the word "may" or "can".

6 Concepts and background

The open architecture of NGNs will enable the creation of new services to be easier and quicker. Services are developed by a service provider (SP) or its partners/suppliers (P/S), for sale within products. A product is what an SP offers or provides to service customers (SC); a product ALWAYS includes a service component. The same service may be included in multiple products, packaged differently, and have different prices for different products, etc.

The supply chain will become more complex and more role types will be involved, e.g., network operators, service customers, service providers, content providers, content aggregators, device manufacturers, etc. The SP can either provide services and products by itself, or assemble services

and products provided by its P/Ss. Assembling services refers to when an SP implements a service based on the chosen set of services provided by its P/Ss. An assembled service can be composed of a single service provided by a P/S, with or without any changes, or it can be composed of multiple services provided by different P/Ss. The assembling of products refers to the implementation of an assembly of one or more existing service specifications by an SP. The implementation of a product specification or the creation of a new product is done either from scratch or by creating a new version of an existing one. In this case the P/S may only provide services for an SP, and then the SP assembles them as a product and delivers them to the SC. In another case, an SP may assemble products provided by other P/Ss through contractual agreements where the P/S is the owner and SP takes the role of the customer. The SP may do a combination of the above two cases.

In an NGN environment, it will become more common for SPs to assemble services and products provided by its P/S(s), to deliver to its customers. The B2B interfaces for service and product lifecycle management between an SP and its P/S(s) are becoming more frequent and important. This introduces increasing requirements to identify the core interfaces that need to be standardized to enable an SP and its P/S(s) to collaborate with regard to the phases of service and product lifecycle management. Figure 1 illustrates the roles of B2B interfaces in this Recommendation.

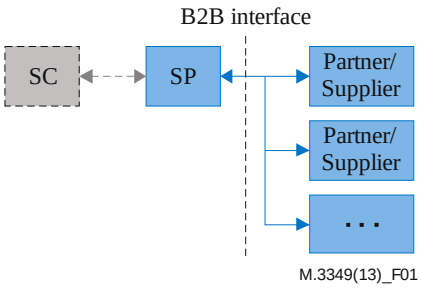

Figure 1 – Roles of B2B interfaces for service and product lifecycle management

This Recommendation contains the requirements for service and product lifecycle management across B2B interfaces in support of NGNs. In general, the service and product lifecycle includes the development, negotiation, implementation, execution, assessment and decommissioning phases. In each phase, service and product information needs to be exchanged between an SP and its P/S(s) across B2B interfaces. These open interfaces will permit the interoperability across an SP and its P/S(s). Clear and well understood interfaces can provide a means for creating common practices for service and product lifecycle management across an SP and its P/S(s). The P/S(s) that wish to participate in the phases of the service and product lifecycle management can enable their service and product by complying with all of the interfaces that are appropriate to the offer that they make.

7 Requirements

7.1 Business level requirements

7.1.1 Requirements

The general requirements include:

– service development
– service negotiation
– service implementation
– service execution
– service assessment
– service decommission

– product development
– product negotiation
– product implementation
– product execution
– product assessment
– product decommission.

7.1.1.1 Service development

REQ-SP-FUN-0101 The SP may send service requirements requests, including service functionalities and features to the P/S(s), so that the P/S(s) can provide appropriate services, or develop new services based on these service requirements. The service requirements information includes service function descriptions, service characteristics, etc.

REQ-SP-FUN-0102 The P/S shall be able to send service requirements responses to the SP; these contain information of the services available in the P/S that meet the SP's service requirements.

The information of service requirements responses includes the service ID, service name, service function description, service version, service owner, etc.

REQ-SP-FUN-0103 The SP shall be able to provide the service introduction approval result to the P/S. The resulting information includes the service ID, service name, approval status, approval time, etc. If the requested service introduction has not been approved, the reason should be indicated.

REQ-SP-FUN-0104 The SP shall be able to notify the P/S to test an assembled service (that is, to set up an appointment with its P/S for the service test). The information of service test notification includes the service ID, test plan description, test start time, etc.

REQ-SP-FUN-0105 The SP shall be able to notify the P/S of the service test result. The information of the service test result notification includes the service ID, test result, test completed time, etc.

7.1.1.2 Service negotiation

REQ-SP-FUN-0201 If the service has passed the test, the SP shall be able to initiate a request to the P/S for service contract establishment, including commercial and SLA aspects. The SP shall offer contract information in the request, for negotiation purposes. The information in the service contract shall include the service ID, service name, term/condition number, description, etc.

REQ-SP-FUN-0202 The P/S shall be able to accept or decline the terms/conditions specified in the service contract offered by the SP. If the P/S declines the terms/conditions in the contract, modifications of the terms/conditions in the contract (may be updates or new additions to the existing terms/conditions) shall be notified to the SP.

REQ-SP-FUN-0203 The SP shall be able to accept or decline the terms/conditions specified in the service contract offered by the P/S. If the SP declines the contract (which is modified by the P/S), the modifications of the terms/conditions in the contract shall be notified to the P/S.

REQ-SP-FUN-0204 The SP shall be able to request that the P/S confirms the final service contract. Confirmation of the final service contract by the P/S shall form a bilateral agreement. If the service contract is accepted by the P/S, the information to be returned should include the authorization state, authorization date, valid time, etc. If the service contract is denied by the P/S, the SP shall be able to provide other contract terms/conditions, as specified in REQ-SP-FUN-0201, until the contract is mutually accepted.

REQ-SP-FUN-0205 Either the SP or the P/S shall be able to initiate a request to modify an existing service contract. The change request may include updates or new additions to the existing terms/conditions.

REQ-SP-FUN-0206 Either the SP or the P/S shall be able to accept or decline the service contract change request initiated by the other party. If the change request is accepted, the above negotiation can be repeated between the SP and P/S, until the contract is mutually agreed upon again. If the change request is not accepted by the SP or P/S, the service contract will remain unchanged.

7.1.1.3 Service implementation

REQ-SP-FUN-0301 The SP shall be able to notify the P/S of the service release information. The notification information includes the service ID, releasing time (the start time of the service operation), etc.

REQ-SP-FUN-0302 The P/S may request that the SP queries the service information. The SP shall return the query result. The resulting information contains a list of the service ID, service name, service description, service version, service status, service owner, etc.

7.1.1.4 Service execution

REQ-SP-FUN-0401 If the SP detects any problems in a service provided by the P/S, the SP shall be able to suspend the assembled service operation and send the suspension notification to the P/S. The notification information includes the service ID and suspended time.

REQ-SP-FUN-0402 Due to the P/S' internal service operation problems or other administrative reasons (maintenance, upgrade, etc.), the P/S shall be able to notify the SP that the service the P/S has provided to the SP is not functioning well. The SP may decide to suspend the service based on this notification. The notification information includes: service ID, status of the service.

REQ-SP-FUN-0403 After the problems have been solved, the P/S shall be able to notify the SP that the service has been recovered. The SP can decide whether to resume the assembled service or not, based on this information. The notification information includes: service ID, status of the service.

REQ-SP-FUN-0404 When a service with a problem has recovered, the SP shall be able to resume the assembled service operation, and send the resumption notification to the P/S. The notification information includes the service ID and resumed time.

REQ-SP-FUN-0405 The P/S shall be able to request the SP to modify the information related to the service and the SP shall return the service modification result. The modifiable basic service attributes include the service name, service description, service version, service owner, etc.

7.1.1.5 Service assessment

REQ-SP-FUN-0501 The SP shall be able to send the service operating performance report (assessment result) to the P/S regularly, e.g., daily, weekly or monthly. The report includes basic service information (service name, service description, service version, service status and service owner) and performance information, such as service operation statistics, SLA satisfaction aspects, report time, etc.

REQ-SP-FUN-0502 The P/S shall be able to request that the SP queries the service operating performance information. The information includes service operation statistics, SLA satisfaction aspects, report time, etc.

7.1.1.6 Service decommission

REQ-SP-FUN-0601 Due to the P/S' service operation problems, or the expiration of service operation, the SP shall be able to terminate the service operation and send the notification of the service operation termination to the P/S. When the service operation is terminated, all the products based on the service will be terminated.

REQ-SP-FUN-0602 Due to the P/S' internal reasons, the P/S shall be able to request that the SP terminates the service operation and the SP shall return the service termination result. When the service operation is terminated, all the products based on the service will be terminated.

REQ-SP-FUN-0603 After the termination of the service operation, the SP shall be able to notify the P/S to terminate the service contract. If the SP and the P/S have agreed to terminate the service contract, then the SP deals with the subscriptions of the service and its related products. The service will be retired after all the subscriptions of the service and related products have been terminated. When the service is retired, all the products based on the service will be retired.

7.1.1.7 Product development

REQ-SP-FUN-0701 The SP may send product requirements requests, including product functionalities and features to the P/S(s), so that the P/S(s) can provide appropriate products or develop new products based on these product requirements. The product requirements information includes product function descriptions, product characteristics, etc.

REQ-SP-FUN-0702 The P/S shall be able to send product requirements responses to the SP, containing the information of the product available in the P/S that meets the SP's product requirements.

The information of the product requirements responses includes a list of the product ID, product name, product type, product brand (trademark of the product), product function description, product owner, valid time, etc.

REQ-SP-FUN-0703 The SP shall be able to provide the product introduction approval result to the P/S. The resulting information includes the product ID, product name, approval status, approval time, etc. If the requested product introduction has not been approved, the reason should be indicated.

REQ-SP-FUN-0704 The SP shall be able to notify the P/S to test a product provided by the P/S (that is, to set up an appointment with its P/S for the product test). The information of notification includes the product ID, test plan description, test start time, etc.

REQ-SP-FUN-0705 The SP shall be able to notify the P/S of the product test result. The information of the product test result notification includes the product ID, test result, test completed time, etc.

7.1.1.8 Product negotiation

REQ-SP-FUN-0801 If the product has passed the test, the SP shall be able to initiate a request to the P/S for product contract establishment, including commercial and SLA aspects. The SP shall offer contract information in the request for negotiation purposes. The information of the product contract includes the product ID, product name, term/condition number, description, etc.

REQ-SP-FUN-0802 The P/S shall be able to accept or decline the terms/conditions specified in the product contract offered by the SP. If the P/S declines the terms/conditions specified in the contract, the modifications of the terms/conditions in the contract (may be updates or new additions to the existing terms/conditions) shall be notified to the SP.

REQ-SP-FUN-0803 The SP shall be able to accept or decline the terms/conditions specified in the product contract offered by the P/S. If the SP declines the contract (which is modified by the P/S), the modifications of the terms/conditions in the contract shall be notified to the P/S.

REQ-SP-FUN-0804 The SP shall be able to request that the P/S confirms the final product contract. Confirmation of the final product contract by the P/S shall form a bilateral agreement. If the product contract is accepted by the P/S, the following information should be returned, including the authorization state, authorization date, valid time, etc. If the product contract is denied by the P/S, the SP shall be able to provide other contract terms/conditions, as specified in REQ-SP-FUN-0801, until the contract is mutually accepted.

REQ-SP-FUN-0805 Either the SP or the P/S shall be able to initiate a request to modify an existing product contract. The change request may include updates or new additions to the existing terms/conditions.

REQ-SP-FUN-0806 Either the SP or the P/S shall be able to accept or decline the product contract change request initiated by the other party. If the change request is accepted, the above negotiation can be repeated between the SP and P/S, until the contract is mutually agreed upon again. If the change request is not accepted by the SP or P/S, the product operation contract remains unchanged.

7.1.1.9 Product implementation

REQ-SP-FUN-0901 The SP shall be able to notify the P/S of the product release information. The notification information includes the product ID, release time (the start time of the product operation), etc.

REQ-SP-FUN-0902 The P/S may request that the SP to queries the product information. The SP shall return the query result. The resulting information contains a list of the product ID, product name, product type, product description, product version, product status, product owner, etc.

7.1.1.10 Product execution

REQ-SP-FUN-1001 If the SP detects any problems in a product provided by the P/S, the SP shall be able to suspend the assembled product operation and send the suspension notification to the P/S. The notification information includes the product ID, suspended time.

REQ-SP-FUN-1002 Due to the P/S' internal product operation problems or other administrative reasons (maintenance, upgrade, etc.), the P/S shall be able to request that the SP suspends the product and the SP shall return the product suspending result.

REQ-SP-FUN-1003 After the problems have been solved, the P/S shall be able to request that the SP resumes the product operation and the SP shall return the product operation resumption result.

REQ-SP-FUN-1004 The P/S shall be able to request that the SP modifies the information related to the product and the SP shall return the product modification result. The modifiable basic product attributes include the product name, product description, product version, product owner, etc.

7.1.1.11 Product assessment

REQ-SP-FUN-1101 The SP shall be able to send the product operating performance report (assessment result) to the P/S regularly, e.g., daily, weekly or monthly. The report includes basic product information (product name, product type, product description, product version, product status, product owner) and performance information, such as product operation statistics, SLA satisfaction aspects, report time, etc.

REQ-SP-FUN-1102 The P/S shall be able to request that the SP queries the product operating performance information. The information includes product operation statistics, SLA satisfaction aspects, report time, etc.

7.1.1.12 Product decommission

REQ-SP-FUN-1201 Due to the P/S' product operation problems, or the expiration of a product operation, the SP shall be able to terminate the product operation and send the notification of the product operation termination to the P/S. If the product operation is terminated, the product cannot be subscribed to by customers.

REQ-SP-FUN-1202 Due to P/S' internal reasons, the P/S shall be able to request SP to terminate the product operation and the SP shall return the product termination result. If the product operation is terminated, the product cannot be subscribed to by customers.

REQ-SP-FUN-1203 After the termination of the product operation, the SP shall be able to notify the P/S to terminate the product contract. If the SP and the P/S have agreed to terminate the product contract, then the SP deals with the subscriptions of the product. The product will be retired after all the subscriptions of the product have been terminated.

7.1.1.13 Non-functional requirements

None.

7.1.2 Actor roles

SP (service provider)

P/S (partner/supplier).

7.1.3 Telecommunication resources

The managed network resources are viewed as relevant telecommunication resources in this Recommendation.

7.1.4 High level use case diagrams

The following figures illustrate the high-level use case diagrams that summarize the functionality and interfaces of the service and product lifecycle management. Figure 2 illustrates the service lifecycle management general use cases, Figure 3 illustrates the product lifecycle management general use cases, Figure 4 illustrates the service lifecycle management use cases initiated by the P/S, Figure 5 illustrates the service lifecycle management use cases initiated by the SP, Figure 6 illustrates the product lifecycle management use cases initiated by the P/S and Figure 7 illustrates the product lifecycle management use cases initiated by the SP.

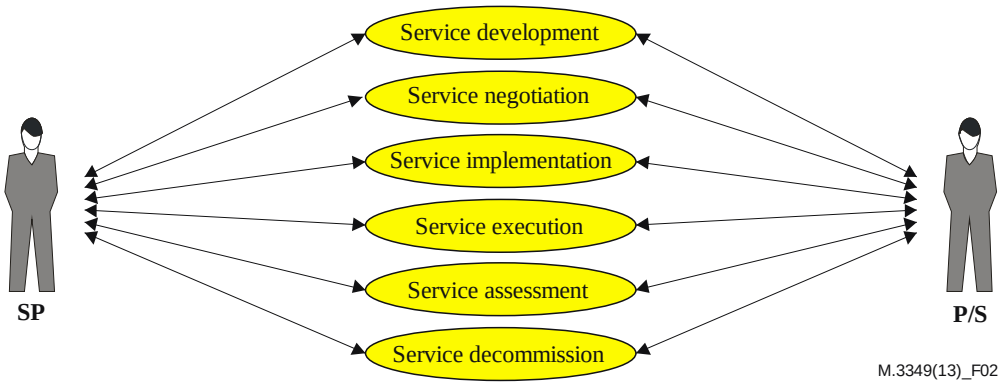

Figure 2 – Service lifecycle management general use cases

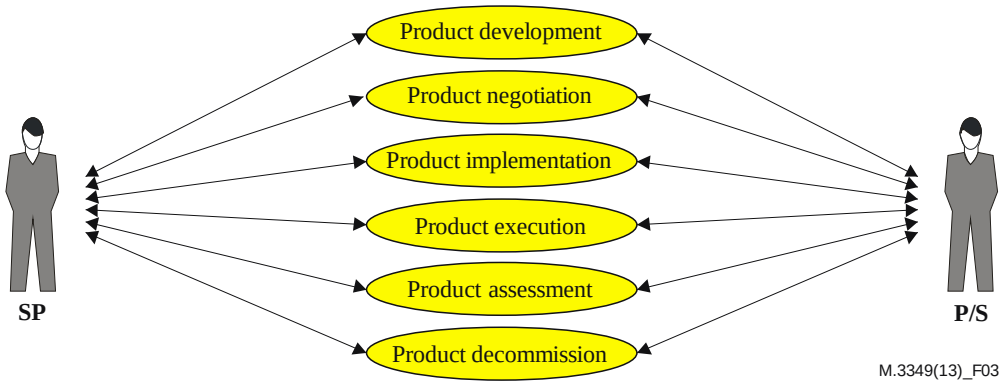

Figure 3 – Product lifecycle management general use cases

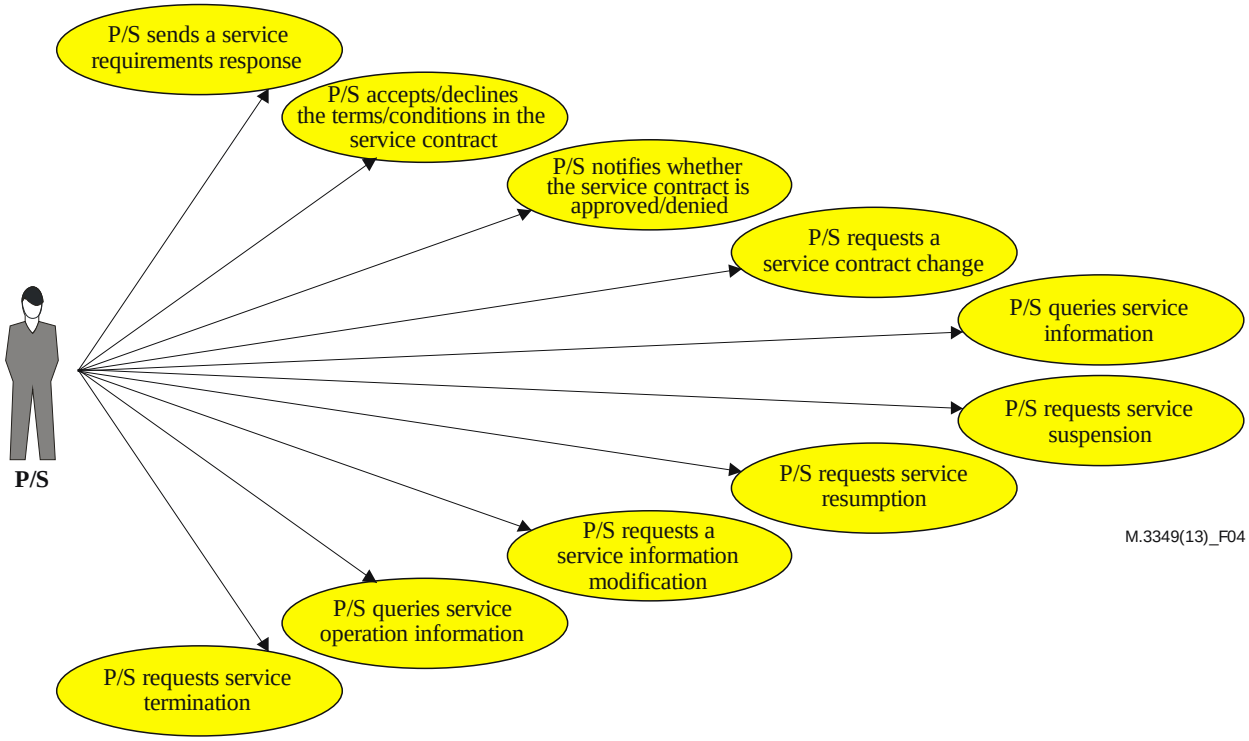

Figure 4 – P/S-initiated service lifecycle management use cases

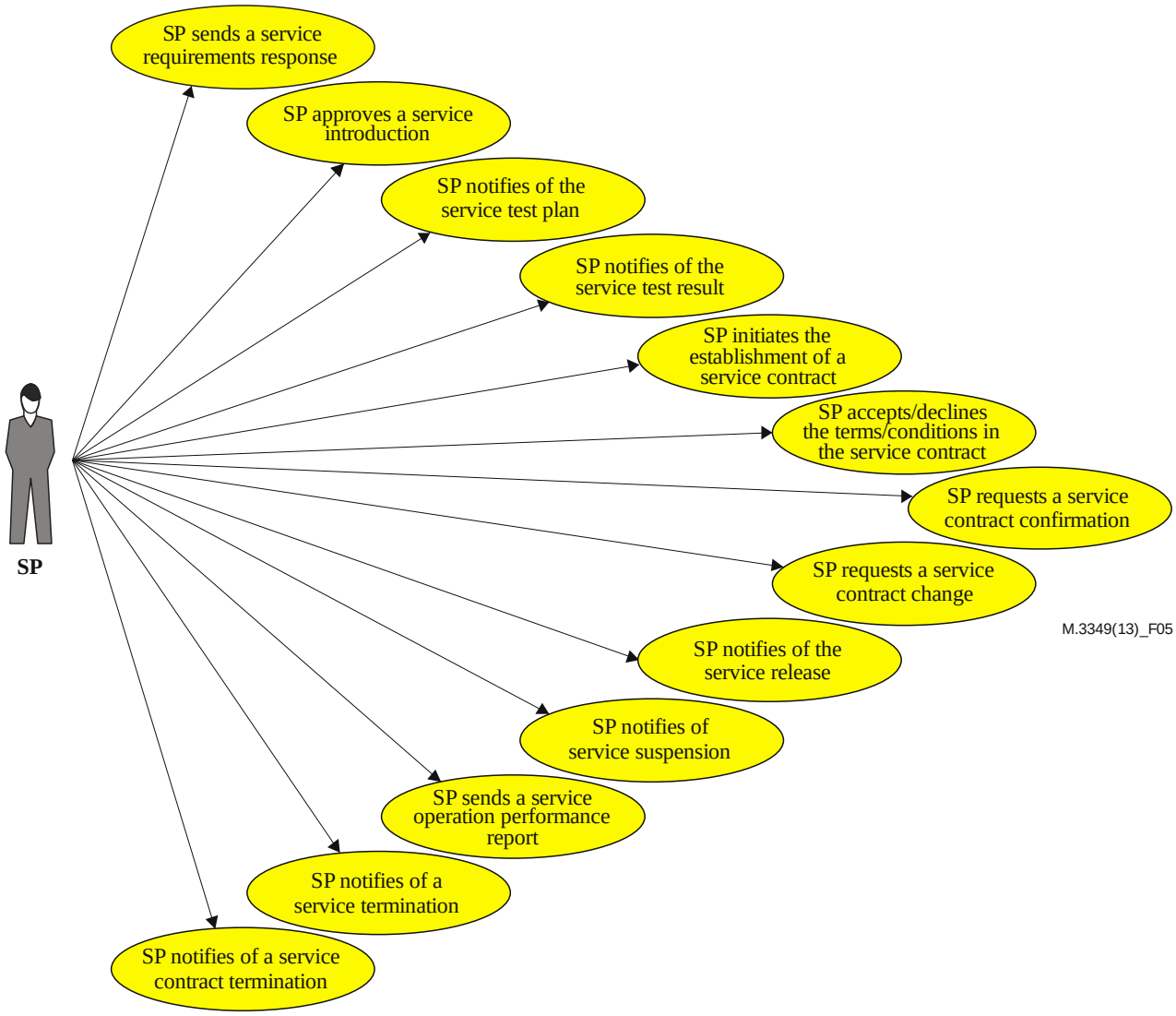

Figure 5 – SP-initiated service lifecycle management use cases

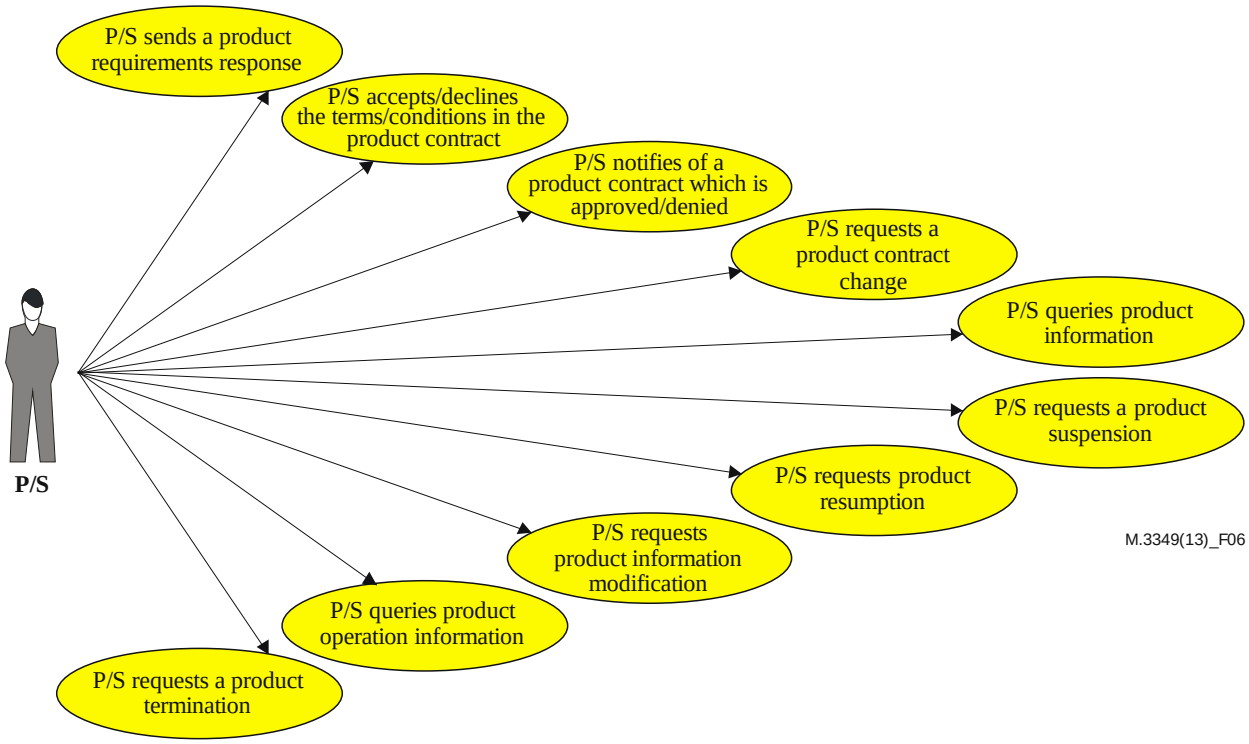

Figure 6 – P/S-initiated product lifecycle management use cases

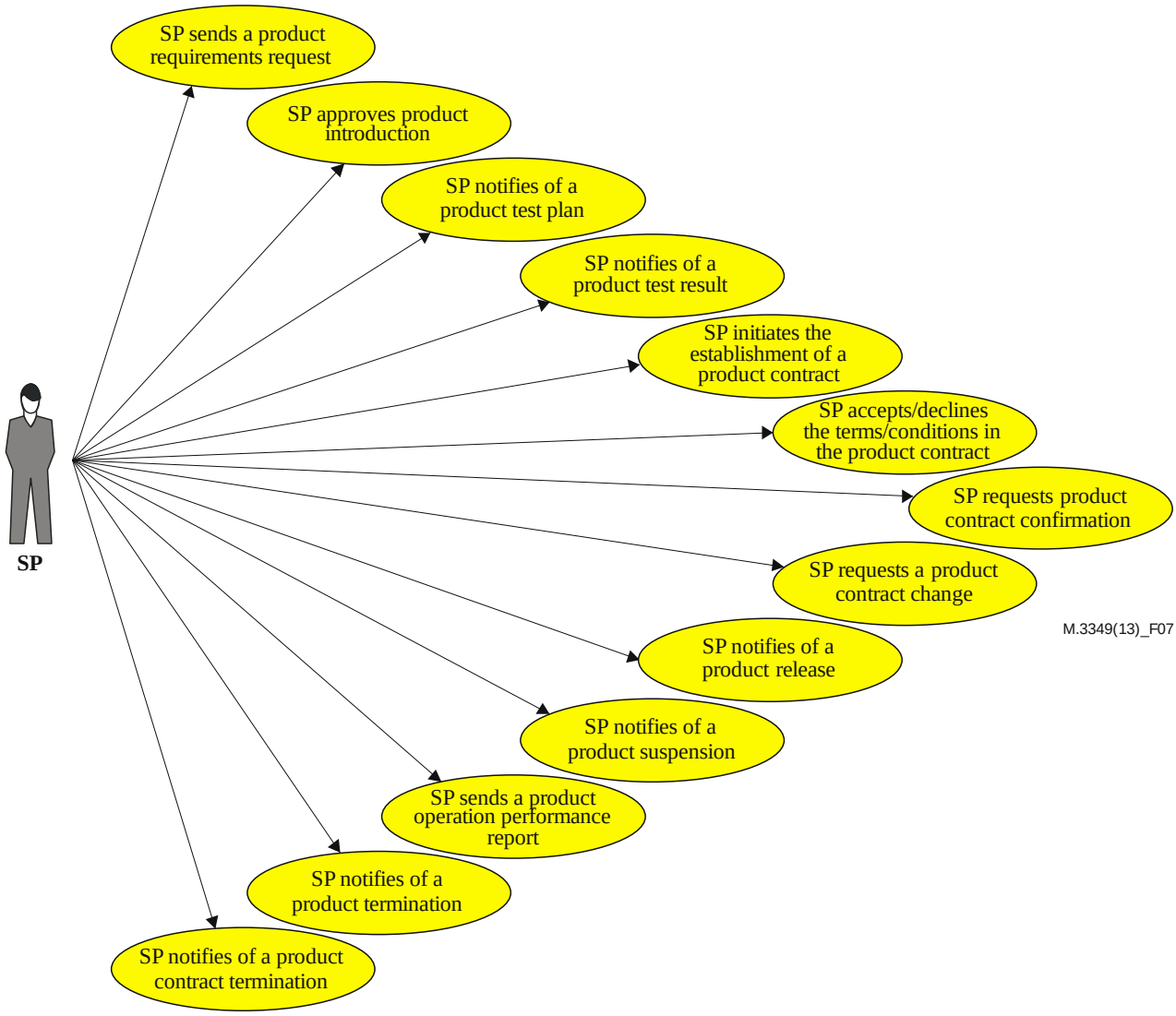

Figure 7 – SP-initiated product lifecycle management use cases

7.2 Specification level requirements

7.2.1 Requirements

There are no specification level requirements.

7.2.2 Actor roles

See clause 7.1.2.

7.2.3 Telecommunication resources

See clause 7.1.3.

7.2.4 Use cases

7.2.4.1 SP sends a service requirements request

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends a service requirements request to the P/S(s), so that the P/S(s) can provide appropriate services or develop new services based on these service requirements.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	The communication between the SP management system and the P/S management system is available.	
Pre-conditions	None.	
Begins when	The SP sends a request to the P/S(s) for service requirements announcements.	
Step 1 (M)	The SP provides the service requirements to the P/S(s) in this request. The information of the service requirements includes the following functionalities and features: – service ID – service name – service function description – service characteristics.	
Ends when	The P/S has received the service requirements.	
Exceptions	Invalid parameter, communication or process failure.	
Post-conditions	The P/S receives the information of the requested services.	
Traceability	REQ-SP-FUN-0101	

7.2.4.2 P/S sends a service requirements response

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S sends a service requirement response to the SP to assemble the service.	
Actors and roles	The SP is the consumer of the response.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received the service requirements request from the SP.	
Begins when	The P/S sends a service requirement response to the SP.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The P/S sends a service requirement response to the SP, containing the information of the services available in the P/S that meets the SP's service requirements. The response should include the following information: – service ID – service name – service function description – service version – service owner.	
Ends when	The SP has received the service requirements response.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The SP receives the information of the requested services response.	
Traceability	REQ-SP-FUN-0102	

7.2.4.3 SP approves a service introduction

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends the service introduction approval result to the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP received the service requirements response from the P/S.	
Begins when	The SP sends a service introduction approval result to the P/S.	
Step 1.1 (M)	The SP sends a service introduction approval result to the P/S. The approval result should include the following information. – service ID – service name – approval status – approval time – reason (optional) (Note).	
Step 1.2 (M)	The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a notification indicating whether the specified service introduction has been approved or not.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The status of the specified service is "Approved" if the SP approves the service introduction.	
Traceability	REQ-SP-FUN-0103	
NOTE – If the requested service introduction has not been approved by the SP, the reason should be indicated.		

7.2.4.4 SP notifies of the service test plan

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S about the test plan of an assembled service.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The assembly of the service has been completed by the SP.	
Begins when	The SP sends the service test plan notification to the P/S.	
Step 1 (M)	The SP sends a service test start notification to the P/S, and the notification should include the following information: – service ID – test plan description – test start time.	
Ends when	The SP has sent out the service test plan notification.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the service test plan notification.	
Traceability	REQ-SP-FUN-0104	

7.2.4.5 SP notifies of the service test result

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the service test result.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The test of the assembled service has been completed.	
Begins when	The SP sends the service test result notification.	
Step 1 (M)	The SP sends a service test result notification to the P/S, and the notification should include the following information: – service ID – test result – test completed time.	
Ends when	The SP has sent out the notification of the service test result.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the notification of the service test result.	
Traceability	REQ-SP-FUN-0105	

7.2.4.6 SP initiates the establishment of a service contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP initiates a request to the P/S for service contract establishment.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The test of the assembled service has been passed.	
Begins when	The SP sends a request to the P/S for service contract establishment.	
Step 1 (M)	The SP sends a request to the P/S for service contract establishment. The request should include the following information: – contract ID – service ID – service name – a list of the following: • term/condition number • description. The terms include SLA aspects.	
Ends when	The request is emitted by the SP.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the request.	
Traceability	REQ-SP-FUN-0201	

7.2.4.7 P/S accepts/declines the terms/conditions in the service contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S sends a notification to the SP to accept or decline the terms/conditions in the service contract offered by the SP.	
Actors and roles	The SP is the consumer of the notification from the P/S.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received the initial service contract from the SP.	
Begins when	The P/S sends a notification to accept or decline the terms/conditions in the service contract.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The P/S sends a notification to accept or decline the terms/conditions in the service contract offered by the SP. The notification should include the following information: – contract ID – service ID – a list of the following: • term/condition number • isAccepted • reason[1] (optional) • proposed modifications[2] (optional); – a list of additions (optional): • term/condition number • description.	
Ends when	The notification is emitted by the P/S.	
Exceptions	Unknown contract ID or service ID, communication or process failure.	
Post-conditions	The SP receives the notification.	
Traceability	REQ-SP-FUN-0202, REQ-SP-FUN-0206	

[1] If the term/condition is not accepted, the reason why the P/S declines the term/condition shall be specified.

[2] If the term/condition is not accepted, the modification of the term/condition in the contract shall be specified by the P/S.

7.2.4.8 SP accepts/declines the terms/conditions in the service contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S whether it accepts or declines the terms/conditions in the service contract offered by the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP has received a modification of terms/conditions in the service contract from the P/S.	
Begins when	The SP sends a notification to accept or decline the offered terms/conditions in the contract associated with a specific service.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The SP accepts or declines the terms/conditions offered by the P/S. If the terms/conditions are not accepted, the SP sends a notification of the modifications of the terms/conditions in the contract. The request should include the following information: – contract ID – service ID – a list of the following: • term/condition number • isAccepted • reason[1] (optional) • proposed modifications[2] (optional); – a list of additions (optional): • term/condition number • description.	
Ends when	The notification is emitted by the SP.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the notification.	
Traceability	REQ-SP-FUN-0203, REQ-SP-FUN-0206	

[1] If the term/condition is not accepted, the reason why the SP declines the term/condition shall be specified.

[2] If the term/condition is not accepted, the modification of the term/condition in the contract shall be specified by the SP.

7.2.4.9 SP requests a service contract confirmation

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP requests that the P/S confirms all the terms/conditions related to the service contract.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP has selected the appropriate contract terms/conditions, which satisfy both the SP and P/S through the negotiation, to form the final contract.	
Begins when	The SP sends a request to the P/S for terms/conditions confirmation.	
Step 1 (M)	The SP initiates a request to the P/S for service contract confirmation. All the terms/conditions should be indicated in the request, including: – contract ID – service ID – service name – a list of the following: • term/condition number • description.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Ends when	The request is emitted by the SP.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The request is received by the P/S.	
Traceability	REQ-SP-FUN-0204	

7.2.4.10 P/S notifies whether the service contract is approved/denied

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S notifies the SP of either approving or denying the service contract indicated in the confirmation request.	
Actors and roles	The SP is the consumer of the notification from the P/S.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received a request confirming a service contract from the SP.	
Begins when	The P/S sends a notification to approve or deny the service contract.	
Step 1 (M)	The P/S approves or denies the service contract indicated in the request. The information in the notification includes: – contract ID – service ID – authorization state – authorization date[1)] (optional) – valid time[1)] (optional) – reject reason[2)] (optional).	
Step 2.1 (M)	If all the terms/conditions are accepted by the P/S, the service contract is approved by both sides.	
Step 2.2 (M)	If the service contract is denied by the P/S, the rejection reason must be specified. Then the SP can trigger the use case "SP initiates the establishment of a service contract" to request another service contract until the contract is accepted by both sides.	SP initiates the establish-ment of a service contract
Ends when	The notification is emitted by the P/S.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The SP is informed of the result.	
Traceability	REQ-SP-FUN-0204	

[1)] Applicable only when the contract is approved by the P/S.

[2)] Applicable only when the contract is denied by the P/S.

7.2.4.11 P/S requests a service contract change

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP modifies the existing service contract.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The contract to be changed has been approved.	
Begins when	The P/S initiates a request to modify the introduction or operation information associated with a specific service in the contract.	
Step 1 (M)	The P/S sends a request to the SP to modify the service contract of a specific service. The request should include the following information: – contract ID – service ID – a list of the modifications (optional)[1]: • term/condition number • proposed modification; – a list of additions (optional)[1]: • term/condition number • description – reason[2].	
Ends when	The request is emitted by the P/S.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The SP receives the request.	
Traceability	REQ-SP-FUN-0205	
[1] The modification can be either updating the existing descriptions or adding new terms/conditions. [2] The reason why the P/S changes the service contract shall be specified.		

7.2.4.12 SP requests a service contract change

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP requests that the P/S modifies the existing service contract.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The contract to be changed has been approved.	
Begins when	The SP initiates a request to modify the operation information associated with a specific service in the contract.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The SP sends a request to the P/S to modify the service contract of a specific service; the request should include the following information: – contract ID – service ID – a list of the modifications (optional)[1]: • term/condition number • proposed modification; – a list of the additions(optional)[1]: • term/condition number • description; – reason[2].	
Ends when	The request is emitted by the SP.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the request.	
Traceability	REQ-SP-FUN-0205	
[1] The modification can be either updating the existing descriptions or adding new terms/conditions. [2] The reason why the SP changes the service contract shall be specified.		

7.2.4.13 SP notifies of the service release

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the service release information.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service has been deployed.	
Begins when	The SP sends the service release notification.	
Step 1 (M)	The SP sends a service release notification to the P/S, and the notification should include the following information: – service ID – release time.	
Ends when	The SP has sent out the service release notification.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the service release notification.	
Traceability	REQ-SP-FUN-0301	

7.2.4.14 P/S queries service information

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP queries the service information. The SP shall return the query result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service has been deployed.	
Begins when	The P/S sends a request to query the information of the specific service.	
Step 1 (M)	The P/S sends a request to the SP to query the information of the specific services or all services which are provided by the P/S. The request should include the following information: – service ID list (Note).	
Step 2.1 (M)	When the requested retrieval has been completed, the SP returns the service information, which should contain the a list of the following: – service ID – service name – service description – service version – service status.	
Step 2.2 (M)	If the retrieval fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The result is returned by the SP, or some error occurs.	
Exceptions	Unknown service ID list, communication or process failure.	
Post-conditions	The P/S receives the information of the requested services.	
Traceability	REQ-SP-FUN-0302	
NOTE – When the P/S needs to query the information of all the services which are provided by the P/S, the service ID list shall be empty.		

7.2.4.15 P/S requests service suspension

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	Due to the P/S' internal service operation problems or other administrative reasons (maintenance, upgrade, etc.), the P/S requests that the SP suspends an assembled service.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The specified service is operating.	
Begins when	The P/S sends a request to the SP to suspend a specific service.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The P/S sends a request to the SP to suspend a specific service, and the request should include the following information: – service ID.	
Ends when	The SP gives the P/S a response indicating that the specified service has been suspended successfully, or that the operation has failed because of some errors.	
Exceptions	Unknown service ID, service already suspended, communication or process failure.	
Post-conditions	The status of the specified service is "Suspended".	
Traceability	REQ-SP-FUN-0402	

7.2.4.16 SP notifies of service suspension

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	If the SP detects any problems in a service provided by the P/S or receives a suspension request from the P/S, the SP suspends the operation of the assembled service and sends the suspension notification to the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The assembled service has been suspended by the SP.	
Begins when	The SP sends the service suspension notification.	
Step 1 (M)	The SP sends a service suspension notification to the P/S, and the notification should include the following information: – service ID – suspended time.	
Ends when	The SP has sent out the service suspension notification.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the service suspension notification.	
Traceability	REQ-SP-FUN-0401,REQ-SP-FUN-0402	

7.2.4.17 P/S requests service resumption

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP resumes the operation of a service, and the SP shall return the service operation resumption result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Pre-conditions	The status of the service is "Suspended".	
Begins when	The P/S sends a request to the SP to resume a specific service.	
Step 1 (M)	The P/S sends a request to the SP to resume a specific service, and the request should include the following information: – service ID.	
Step 2.1 (M)	When the requested service has been resumed, the SP returns the successful indication result: – resuming time.	
Step 2.2 (M)	If the operation fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a response indicating that the specified service has resumed successfully, or the operation fails because of some errors.	
Exceptions	Unknown service ID, service already resumed, communication or process failure.	
Post-conditions	The status of the specified service is "Resumed".	
Traceability	REQ-SP-FUN-0403	

7.2.4.18 P/S requests a service information modification

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP modifies the information related to a specific service and the SP returns the service modification result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	None.	
Begins when	The P/S sends a request to modify the basic information associated with a specific service.	
Step 1 (M)	The P/S sends a request to the SP to modify the service parameters of a specific service, and the request should include the following information: – service ID – a list of names and new value pairs of the service attributes to be modified (Note).	
Step 2.1 (M)	When the requested service modification has been completed, the SP returns the successful indication result.	
Step 2.2 (M)	If the modification fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a response indicating that the specified service attribute values have been modified successfully, or that the modification has failed because of some errors.	
Exceptions	Unknown service ID, unknown parameter, incorrect parameter values, communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The attributes' values of the specified service have been modified.	
Traceability	REQ-SP-FUN-0404	
NOTE – The modifiable basic service attributes include service name, service function description, service version, service owner, etc.		

7.2.4.19 SP sends a service operation performance report

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends the service operation performance report to the P/S.	
Actors and roles	The P/S is the consumer of the report from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service has been operated.	
Begins when	The SP sends the service operation performance report.	
Step 1 (M)	The SP sends a service operation performance report to the P/S regularly, e.g., daily, weekly or monthly, and the report should include the following information: – basic service information – service ID – service performance information – a list of name and value pairs for service operation statistics (including service SLA statistics) – report time.	
Ends when	The SP has sent out the service operation performance report.	
Exceptions	Communication or process failure.	
Post-conditions	The P/S receives the service operation performance report.	
Traceability	REQ-SP-FUN-0501	

7.2.4.20 P/S queries service operation information

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP queries the service operation performance information.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service has been operated.	
Begins when	The P/S sends a request to get the operation performance information of the specific services.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The P/S sends a request to the SP to get the operation performance information of specific services or all the services which are provided by the P/S; the request should include the following information: – service ID list (Note).	
Step 2.1 (M)	When the requested retrieval has been completed, the SP returns the service operation information, which should contain a list of the following: – basic service information – service ID – service performance information – a list of name and value pairs for service operation statistics (including service SLA statistics) – report time.	
Step 2.2 (M)	If the retrieval fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The operation information is returned by the SP, or some error occurs.	
Exceptions	Unknown service ID list, communication or process failure.	
Post-conditions	The P/S receives the operation information of the requested services.	
Traceability	REQ-SP-FUN-0502	
NOTE – When the P/S needs to get operation information of all the services which are provided by the P/S, the service ID list shall be empty.		

7.2.4.21 P/S requests service termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP terminates the operation of a service.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service is in operation.	
Begins when	The P/S sends a request to terminate a specific service.	
Step 1 (M)	The P/S sends a request to the SP to terminate a specific service; the request should include the following information: – service ID.	
Ends when	The SP gives the P/S a response indicating that the specified service has been terminated successfully, or that the operation has failed because of some errors.	
Exceptions	Unknown service ID, service already terminated, communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The status of the specified service is "Terminated". When the service operation has been terminated, all the products based on the service will be terminated. Then the SP can trigger the use case "SP notifies service contract termination". An unexpected service termination may result in a compensation procedure based on the service contract, which is outside the scope of this Recommendation).	
Traceability	REQ-SP-FUN-0602	

7.2.4.22 SP notifies of a service termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	Due to the P/S' service operation problems, or the expiration of service operation, the SP terminates a service operation and sends a notification of the service termination to the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service operation has been terminated.	
Begins when	The SP sends the service termination notification.	
Step 1 (M)	The SP sends a service termination notification to the P/S, and the notification should include the following information: – service ID – terminated time.	
Ends when	The SP has sent out the service termination notification.	
Exceptions	Unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the service termination notification.	
Traceability	REQ-SP-FUN-0601	

7.2.4.23 SP notifies of a service contract termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the termination of a service contract.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The service operation has been terminated.	
Begins when	The SP sends a notification to inform the P/S of the termination of the contract associated with a specific service.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The SP sends a service contract termination notification to the P/S, and the notification should include the following information: – contract ID – service ID.	
Ends when	The SP has sent out the service contract termination notification.	
Exceptions	Unknown contract ID, unknown service ID, communication or process failure.	
Post-conditions	The P/S receives the notification of the specific service contract termination. The SP deals with the subscriptions of the service and its products. The service will be retired after all the subscriptions of the service and related products have been terminated. When the service is retired, all the products based on the service will be retired.	
Traceability	REQ-SP-FUN-0603	

7.2.4.24 SP sends a product requirements request

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends a product requirements request to the P/S(s), so that the P/S(s) can provide appropriate products or develop new products based on these product requirements.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	The communication between the SP management system and the P/S management system is available.	
Pre-conditions	None.	
Begins when	The SP sends a request to the P/S(s) for a product requirements announcement.	
Step 1 (M)	The SP provides product requirements to the P/S(s) in this request. The information of product requirements includes the following functionalities and features: – product ID – product name – product function description – product characteristics.	
Ends when	The P/S has received the product requirements.	
Exceptions	Invalid parameter, communication or process failure.	
Post-conditions	The P/S receives the information of the requested products.	
Traceability	REQ-SP-FUN-0701	

7.2.4.25 P/S sends a product requirements response

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S sends a product requirement response to the SP.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received the product requirements request from the SP.	
Begins when	The P/S sends a product requirement response to the SP.	
Step 1 (M)	The P/S sends a product requirement response to the SP containing the information of the products available in the P/S that meet the SP's product requirements. The response should include the following information: – product ID – product name – product type – product brand – product function description – product owner – valid time.	
Ends when	The SP has received the product requirements response.	
Exceptions	Unknown product ID, communication or process failure.	
Post-conditions	The SP receives the information of the requested product response.	
Traceability	REQ-SP-FUN-0702	

7.2.4.26 SP approves product introduction

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends the product introduction approval result to the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP has received the product requirements response from the P/S.	
Begins when	The SP sends a product introduction approval result to the P/S.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1.1 (M)	The SP sends a product introduction approval result to the P/S. The approval result should include the following information: – product ID – product name – approval status – approval time – reason (optional) (Note).	
Step 1.2 (M)	The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a response indicating whether the specified product introduction has been approved or not.	
Exceptions	Unknown product ID, communication or process failure.	
Post-conditions	The status of the specified product is "Approved" if the SP approves the product introduction.	
Traceability	REQ-SP-FUN-0703	
NOTE – If the requested product introduction has not been approved by the SP, the reason should be indicated.		

7.2.4.27 SP notifies of a product test plan

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S about the test plan of an assembled product.	
Actors and roles	The P/S is the consumer of the notification from SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The assembly of the product has completed.	
Begins when	The SP sends the product test start notification.	
Step 1 (M)	The SP sends a product test start notification to the P/S, and the notification should include the following information: – product ID – test plan description – test start time.	
Ends when	The SP has sent out the product test start notification.	
Exceptions	Unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the product test start notification.	
Traceability	REQ-SP-FUN-0704	

7.2.4.28 SP notifies of a product test result

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the product test result.	
Actors and roles	The P/S is the consumer of the notification from SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The test of the assembled product has completed.	
Begins when	The SP sends the notification of the product test result.	
Step 1 (M)	The SP sends a product test result notification to the P/S, and the notification should include the following information: – product ID – test result – test completed time.	
Ends when	The SP has sent out the notification of the product test result.	
Exceptions	Unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the notification of the product test result.	
Traceability	REQ-SP-FUN-0705	

7.2.4.29 SP initiates the establishment of a product contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP initiates a request to the P/S for product contract establishment.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The test of the assembled product has been passed.	
Begins when	The SP sends a request to the P/S for product contract establishment.	
Step 1 (M)	The SP sends a request to the P/S for product contract establishment; the request should include the following information: – contract ID – product ID – product name – a list of the following: • term/condition number • description. The terms include product SLA aspects.	
Ends when	The request is emitted by the SP.	
Exceptions	Unknown product ID, communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The P/S receives the request.	
Traceability	REQ-SP-FUN-0801	

7.2.4.30 P/S accepts/declines the terms/conditions in the product contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S sends a notification to the SP to accept or decline the terms/conditions in the product contract offered by the SP.	
Actors and roles	The SP is the consumer of the notification from the P/S.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received the initial product contract from the SP.	
Begins when	The P/S sends a notification to accept or decline the terms/conditions in the product contract.	
Step 1 (M)	The P/S sends a notification to accept or decline the terms/conditions in the product contract offered by the SP. The notification should include the following information: – contract ID – product ID – a list of the following: • term/condition number • isAccepted • reason[1)] (optional) • proposed modifications[2)] (optional); – a list of the additions (optional): • term/condition number • description.	
Ends when	The notification is emitted by the P/S.	
Exceptions	Unknown contract ID or product ID, communication or process failure.	
Post-conditions	The SP receives the notification.	
Traceability	REQ-SP-FUN-0802, REQ-SP-FUN-0806	

[1)] If the term/condition is not accepted, the reason why the P/S declines the term/condition shall be specified;

[2)] If the term/condition is not accepted, the modification of term/condition in the contract shall be specified by the P/S.

7.2.4.31 SP accepts/declines the terms/conditions in the product contract

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S whether it accepts or declines the terms/conditions in the product contract offered by the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP has received a modification of terms/conditions in the product contract from the P/S.	
Begins when	The SP sends a notification to accept or decline the offered terms/conditions in the contract associated with a specific product.	
Step 1 (M)	The SP accepts or declines the terms/conditions offered by the P/S. If the terms/conditions are not accepted, the SP sends a notification of the modification of terms/conditions in the contract. The response should include the following information: – contract ID – product ID – a list of the following: • term/condition number • isAccepted • reason[1)] (optional) • proposed modification[2)] (optional); – a list of the additions (optional): • term/condition number • description.	
Ends when	The notification is emitted by the SP.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the notification.	
Traceability	REQ-SP-FUN-0803, REQ-SP-FUN-0806	

[1)] If the term/condition is not accepted, the reason why the SP declines the term/condition shall be specified.
[2)] If the term/condition is not accepted, the modification of term/condition in the contract shall be specified by the SP.

7.2.4.32 SP requests product contract confirmation

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP requests that the P/S confirms all the terms/conditions related to the product contract.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The SP has selected the appropriate contract terms/conditions, which satisfy both the SP and P/S through the negotiation, to form the final contract.	
Begins when	The SP sends a request to the P/S for terms/conditions confirmation.	
Step 1 (M)	The SP initiates a request to the P/S for product contract confirmation. All the terms/conditions should be indicated in the request, including: – contract ID – product ID – product name – a list of the following: • term/condition number • description.	
Ends when	The request is emitted by the SP.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The request is received by the P/S.	
Traceability	REQ-SP-FUN-0804	

7.2.4.33 P/S notifies of a product contract which is approved/denied

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S notifies the SP of either approving or denying the product contract indicated in the confirmation request.	
Actors and roles	The SP is the consumer of the notification from the P/S.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The P/S has received a request confirming a product contract from the SP.	
Begins when	The P/S sends a notification to approve or deny the product contract.	
Step 1 (M)	The P/S approves or denies the product contract indicated in the request. The information in the notification includes: – contract ID – product ID – authorization state – authorization date (optional)[1)] – valid time (optional)[1)] – reject reason (optional)[2)].	
Step 2.1 (M)	If all the terms/conditions are accepted by the P/S, the product contract is approved by both sides.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 2.2 (M)	If the product contract is denied by the P/S, the rejection reason must be specified. Then the SP can trigger the use case "SP initiates the establishment of a product contract" to request another product contract until the contract is accepted by both sides.	SP initiates the establish-ment of a product contract
Ends when	The notification is emitted by the P/S.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The SP is informed of the result.	
Traceability	REQ-SP-FUN-0804	
[1] Applicable only when the contract is approved by the P/S. [2] Applicable only when the contract is denied by the P/S.		

7.2.4.34 P/S requests a product contract change

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP modifies the existing product contract.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The contract to be changed has been approved.	
Begins when	The P/S sends a request to modify the introduction or operation information associated with a specific product in the contract.	
Step 1 (M)	The P/S initiates a request to the SP to modify the product contract of a specific product; the request should include the following information: – contract ID – product ID; – a list of the modifications (optional)[1]: • term/condition number • proposed modification; – a list of the additions (optional)[1]: • term/condition number • description; – reason[2].	
Ends when	The request is emitted by the P/S.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The SP receives the request.	
Traceability	REQ-SP-FUN-0805	
[1] The modification can be either updating the existing descriptions or adding new terms/conditions. [2] The reason why the P/S changes the product contract shall be specified.		

7.2.4.35 SP requests a product contract change

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP requests that the P/S modifies the existing product contract.	
Actors and roles	The P/S is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The contract to be changed has been approved.	
Begins when	The SP initiates a request to modify the introduction or operation information associated with a specific product in the contract.	
Step 1 (M)	The SP initiates a request to the P/S to modify the contract of a specific product; the request should include the following information: – contract ID – product ID; – a list of the modifications (optional)[1]: • term/condition number • proposed modification; – a list of the additions (optional)[1]: • term/condition number • description; – reason[2].	
Ends when	The request is emitted by the SP.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the request.	
Traceability	REQ-SP-FUN-0805	

[1] The modification can be either updating the existing terms/conditions or adding new ones.
[2] The reason why the SP changes the product contract shall be specified.

7.2.4.36 SP notifies of a product release

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the product release information.	
Actors and roles	The P/S is the consumer of the notification from SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product has been deployed.	
Begins when	The SP sends the product release notification.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Step 1 (M)	The SP sends a product release notification to the P/S, and the notification should include the following information: – product ID – release time.	
Ends when	The SP has sent out the product release notification.	
Exceptions	Unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the product release notification.	
Traceability	REQ-SP-FUN-0901	

7.2.4.37 P/S queries product information

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP queries the product information. The SP shall return the query result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product has been deployed.	
Begins when	The P/S sends a request to query the information of the specific products.	
Step 1 (M)	The P/S sends a request to the SP to query the information of specific products or all products which are provided by the P/S; the request should include the following information: – product ID list (Note).	
Step 2.1 (M)	When the requested retrieval has been completed, the SP returns the product information, which should contain a list of the following: – product ID – product name – product type – product description – product version – product status.	
Step 2.2 (M)	If the retrieval fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The result is returned by the SP, or some error occurs.	
Exceptions	Unknown product ID list, communication or process failure.	
Post-conditions	The P/S receives the information of the requested products.	
Traceability	REQ-SP-FUN-0902	
NOTE – When the P/S needs to query the information of all the products which are provided by the P/S, the product ID list shall be empty.		

7.2.4.38 P/S requests a product suspension

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	Due to the P/S' internal product operation problems or other administrative reasons (maintenance, upgrade, etc.), the P/S requests that the SP suspends an assembled product.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The specified product is operating.	
Begins when	The P/S sends a request to the SP to suspend a specific product.	
Step 1 (M)	The P/S sends a request to the SP to suspend a specific product, and the request should include the following information: – product ID.	
Ends when	The SP gives the P/S a response indicating that the specified product has been suspended successfully, or that the operation has failed because of some errors.	
Exceptions	Unknown product ID, product already suspended, communication or process failure.	
Post-conditions	The status of the specified product is "Suspended".	
Traceability	REQ-SP-FUN-1002	

7.2.4.39 SP notifies of a product suspension

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	If the SP detects any problems in a product provided by the P/S or receives a suspension request from the P/S, the SP suspends the operation of the assembled product and sends the suspension notification to P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The assembled product has been suspended by the SP.	
Begins when	The SP sends the product suspension notification.	
Step 1 (M)	The SP sends a product suspension notification to the P/S, and the notification should include the following information: – product ID – suspended time.	
Ends when	The SP has sent out the product suspension notification.	
Exceptions	Unknown product ID, communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The P/S receives the product suspension notification.	
Traceability	REQ-SP-FUN-1001,REQ-SP-FUNC-1002	

7.2.4.40 P/S requests product resumption

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP resumes the operation of a product and the SP shall return the product operation resumption result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The status of the product is "Suspended".	
Begins when	The P/S sends a request to the SP to resume a specific product.	
Step 1 (M)	The P/S sends a request to the SP to resume a specific product, and the request should include the following information: – product ID.	
Step 2.1 (M)	When the requested product has been resumed, the SP returns the successful indication result: – resuming time.	
Step 2.2(M)	If the operation fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a response indicating that the specified product has resumed successfully, or that the operation has failed because of some errors.	
Exceptions	Unknown product ID, product already resumed, communication or process failure.	
Post-conditions	The status of the specified product is "Resumed".	
Traceability	REQ-SP-FUN-1003	

7.2.4.41 P/S requests product information modification

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP modifies the information related to a specific product and the SP returns the product modification result.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	None.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Begins when	The P/S sends a request to modify the basic information associated with a specific product.	
Step 1 (M)	The P/S sends a request to the SP to modify the product parameters of a specific product, and the request should include the following information: – product ID; – a list of the name and new value pairs of the product attributes to be modified (Note).	
Step 2.1 (M)	When the requested product modification has been completed, the SP returns the successful indication result.	
Step 2.2 (M)	If the modification fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The SP gives the P/S a response indicating that the specified product attribute values are modified successfully, or the modification fails because of some errors.	
Exceptions	Unknown product ID, unknown parameter, incorrect parameter values, communication or process failure.	
Post-conditions	The attributes values of the specified product are modified.	
Traceability	REQ-SP-FUN-1004	
NOTE – The modifiable basic product attributes include product name, product function description, product version, product owner, etc.		

7.2.4.42 SP sends a product operation performance report

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP sends the product operation performance report to the P/S.	
Actors and roles	The P/S is the consumer of the report from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product has been operated.	
Begins when	The SP sends the product operation performance report.	
Step 1 (M)	The SP sends a product operation performance report to the P/S regularly, e.g., daily, weekly or monthly, and the report should include the following information: – basic product information: – product ID. – product performance information: – a list of name and value pairs for product operation statistics (including product SLA statistics); – report time.	
Ends when	The SP has sent out the product operation performance report.	
Exceptions	Communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The P/S receives the product operation performance report.	
Traceability	REQ-SP-FUN-1101	

7.4.2.43 P/S queries product operation information

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP queries the product operation performance information.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product has been operated.	
Begins when	The P/S sends a request to get the operation performance information of the specific product.	
Step 1 (M)	The P/S sends a request to the SP to get the operation performance information of specific products or all products which are provided by the P/S; the request should include the following information: – product ID list (Note).	
Step 2.1 (M)	When the requested retrieval has been completed, the SP returns the product operation information, which should contain the following: – basic product information: – product ID. – product performance information: – a list of name and value pairs for product operation statistics (including product SLA statistics); – report time.	
Step 2.2 (M)	If the retrieval fails, the SP will return error information. The possible errors are listed under "Exceptions".	
Ends when	The operation information is returned by the SP, or some error occurs.	
Exceptions	Unknown product ID list, communication or process failure.	
Post-conditions	The P/S receives the operation information of the requested products.	
Traceability	REQ-SP-FUN-1102	
NOTE – When the P/S needs to get operation information of all products which are provided by the P/S, the product ID list can be empty.		

7.2.4.44 P/S requests a product termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The P/S requests that the SP terminates the operation of a product.	
Actors and roles	The SP is the consumer of the request.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product is in operation.	
Begins when	The P/S sends a request to terminate a specific product.	
Step 1 (M)	The P/S sends a request to the SP to terminate a specific product; the request should include the following information: – product ID.	
Ends when	The SP gives the P/S a response indicating that the specified product has been terminated successfully, or that the operation has failed because of some errors.	
Exceptions	Unknown product ID, product already terminated, communication or process failure.	
Post-conditions	The status of the specified product is "Terminated". When the product operation is terminated, the product cannot be subscribed to by customers. Then the SP can trigger the use case "SP notifies product contract termination". (An unexpected product termination may result in a compensation procedure based on the product contract, which is outside the scope of this Recommendation.)	
Traceability	REQ-SP-FUN-1202	

7.2.4.45 SP notifies of a product termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	Due to the P/S' product operation problems, or the expiration of a product operation, the SP terminates a product operation and sends a notification of the product termination to the P/S.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product operation has been terminated.	
Begins when	The SP sends the product termination notification.	
Step 1 (M)	The SP sends a product termination notification to the P/S, and the notification should include the following information: – product ID – terminated time.	
Ends when	The SP has sent out the product termination notification.	
Exceptions	Unknown product ID, communication or process failure.	

Use case stage	Evolution/Specification	<<Uses>> Related use
Post-conditions	The P/S receives the product termination notification.	
Traceability	REQ-SP-FUN-1201	

7.2.4.46 SP notifies of a product contract termination

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The SP notifies the P/S of the termination of a product contract.	
Actors and roles	The P/S is the consumer of the notification from the SP.	
Telecom resources	See clause 7.2.3.	
Assumptions	There is an open communication channel between the SP management system and the P/S management system.	
Pre-conditions	The product operation has been terminated.	
Begins when	The SP sends a notification to inform the P/S of the termination of the contract associated with a specific product.	
Step 1 (M)	The SP sends a product contract termination notification to the P/S, and the notification should include the following information: – contract ID – product ID.	
Ends when	The SP has sent out the contract termination notification.	
Exceptions	Unknown contract ID, unknown product ID, communication or process failure.	
Post-conditions	The P/S receives the notification of the specific product contract termination. The SP deals with the subscriptions of the product. The product will be retired after all the subscriptions of the product have been terminated.	
Traceability	REQ-SP-FUN-1203	

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