EUROPEAN COMMISSION

DIGIT
Connecting Europe Facility

SML

Service Offering Description

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1.03	14/07/2017	CEF Support	Updated the links
1.04	24/01/2018	Caroline AEBY	Review, spelling mistakes correction.
1.05	05/02/2018	Flavio SANTOS	Review Dynamic Discovery
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2.10	15/01/2021	Caroline AEBY	Update document owner
2.20	07/04/2022	Caroline AEBY	No more CEF
2.30	09/11/2022	Caroline AEBY Bogdan DUMITRIU	Add info on SML GTC signature + add link to privacy notice for SML services
2.40	17/11/2022	Caroline AEBY	Maximum number of participants 100K
2.50	03/11/2023	Caroline AEBY	Privacy statement for eDelivery services updated

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1. INTRODUCTION

eDelivery is based on a four-corner model in which the Backend systems exchange messages via Access Points. The eDelivery Service Metadata Locator (SML) enables a Sending Access Point to dynamically discover the IP address of the Receiving Access Point. Instead of looking at a static list of IP addresses, the Sending Access Point consults a Service Metadata Publisher (SMP) where information about every participant in a large message exchange infrastructure is kept up to date, including the IP addresses of the Access Point.
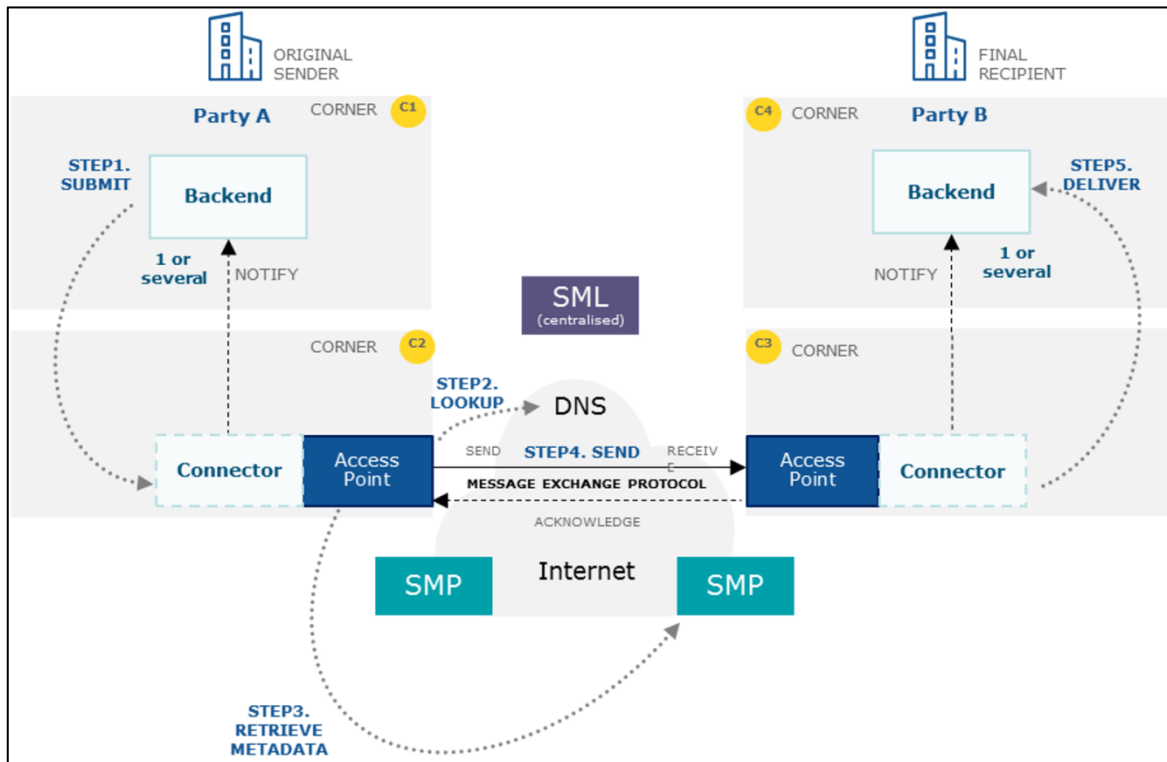
In addition to the Service Metadata Publisher (SMP), the Service Metadata Locator (SML) is the other key component that enables dynamic discovery of participants in message exchange infrastructures. The SML is used to create or update the resource records in the Domain Name System (DNS) so that the Access Points can discover the SMP of the receiving participant. As a result, these infrastructures can scale up without being affected by the management of an increasing number of participants. Instead of having to centrally manage a list of Access Points (known as 'static discovery') which all of them must be able to access and download, the discovery of participants becomes dynamic and possibly fully distributed and consequently much more scalable.

The current eDelivery SML service implements both the eDelivery SML specifications and the PEPPOL Transport Infrastructure SML specifications. The eDelivery SML Service uses a sample implementation of the SML software maintained by the European Commission.

1.1. Purpose of the service

For cross-border message exchange infrastructures to scale, the management of participants must become as dynamic and distributed as possible. Consequently, eDelivery suggests a discovery system based on two components: a central SML and one or several SMPs. If several SMPs are used, then discovery becomes both dynamic and distributed. If a single SMP is used, then discovery becomes dynamic but centralised. Once these components are deployed, Access Points can discover each other by first consulting the metadata stored in a SMP. In eDelivery message exchange infrastructures with dynamic discovery, a sending Access Point consults the capabilities of the receiving Access Point published on a SMP to decide whether that Access Point is eligible and able to receive specific types of messages.

To use such a SMP, the sending Access Point needs to know its location. This happens by constructing a unique and standardised URL based on the resolution of a Domain Name in the Domain Name System (DNS). This is possible because each Participant must have their metadata exclusively registered within one SMP. The sending Access Point constructs the URL for retrieving the metadata for a given recipient participant identifier using a standard format:

The user has to first retrieve the list of Services.

Example:

```
http://test-infra.peppol.at/iso6523-actorid-upis%3A%3A9915%3Atest/.
```

Then the user has to access any one of the listed services using the following format:

Error! Hyperlink reference not valid.>

Example:

```
http://test-infra.peppol.at/iso6523-actorid-upis%3A%3A9915%3Atest/services/busdox-docid-qns%3A%3Aurn%3Aoasis%3Anames%3Aspecification%3Aubl%3Aschema%3Axsd%3AInvoice-2%3A%3AInvoice%23%23urn%3Awww.cenbii.eu%3Atransaction%3Abiitrns010%3Aver2.0%3Aextended%3Aurn%3Awww.peppol.eu%3Abis%3Apeppol4a%3Aver2.0%3Aextended%3Aurn%3Awww.erechnung.gv.at%3Aver1.0%3A%3A2.1
```

Consequently, each participant gets a unique URL for its metadata. The SML service can generate one CNAME record as well as one NAPTR[1] record per participant.

The SML uses the CNAME record type and creates domain names using the scheme *<hash over recipientID>.<schemeID>.<SML domain>.* The Domain Name is registered within a CNAME[2] record in the DNS.

As the eDelivery SML Service implements the [Business Document Metadata Service Location](#) specification (BDXL), it is also possible for the sending Access Point to execute a NAPTR query to retrieve the metadata of the receiving Access Point.

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[1] DNS NAPTR record is specified in [RFC 2915](#)

[2] DNS CNAME record is specified in [RFC 1034](#) and clarified in Section 10 of [RFC 2181](#)

An example of a DNS listing for participantId Value: dynceftestparty5gw is shown below:

```
participantScheme: connectivity-partyid-qns

Sub-domain: connectivitytest

Domain: acc.edelivery.tech.ec.europa.eu.
```

Domain: acc.edelivery.tech.ec.europa.eu.

```
NQU57KLCR67YZEXEOGLJNQSOPZO2CT6DM7Q6DFPBJVFYAU4DNM6A.connectivity-partid-
qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60        IN        NAPTR        100 10 "U" "Meta:SMP"
"!^.*$!http://40.115.23.114:38080/!" .
UGF55C5O465A2ZXU6BTWNV3RJMVDJSDHTNF3V2GLCZEW2HISSBVA.connectivity-partid-
qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60        IN        NAPTR        100 10 "U" "Meta:SMP"
"!^.*$!http://40.115.23.114:38080/!" .
USOCMXLB3RWRWVAIELSG4NNHIVECX35XVZR5I2XCM6UUY7FLECBA.connectivity-partid-
qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60        IN        NAPTR        100 10 "U" "Meta:SMP"
"!^.*$!http://40.118.20.112:38080/smp!" .
B-c39e97893795f3c13306263056d902e9.connectivity-partyid-qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.
C4JSQDPW5DFDR5GTRCDQGW4XAYX2WIFHKDUUQZ2XK325NBTLRSAA.connectivity-partyid-
qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60        IN        NAPTR        100 10 "U" "Meta:SMP"
"!^.*$!http://40.115.23.114:38080/!" .
B-adb4c6d3821d142c684b13ed269fad65.ehealth-actorid-qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60
DALXFO3CDYE5ZSLF5WAVCYQ3XGERI6ONUBJU5WAH3T77THFWCGEQ.ehealth-actorid-
qns.connectivitytest.acc.edelivery.tech.ec.europa.eu.        60        IN        NAPTR        100 10 "U" "Meta:SMP"
"!^.*$!http://40.115.21.208:7001/cipa-smp-full-webapp-4.0.0-RC1!" .
7KDEJXMHGW7UHILIK7HDYXPJK2PY52PZK3RX37N252TMM7VCNFOA.ehealth-actorid-qns.ehealth.acc.edelivery.tech.ec.europa.eu.
7ZFQKK3YF4XIQVW54LC4FMJJOSBX3C6AA5YTMKLKRSBLYUCINB7Q.ehealth-actorid-qns.ehealth.acc.edelivery.tech.ec.europa.eu.
ANXD5CSJJWLXESB5QB2M2HJUXX34ZU6MFFWQXRL4M4VHVO7XXY2A.ehealth-actorid-qns.ehealth.acc.edelivery.tech.ec.europa.eu.
B-02baca6cc4d7f0e99a3b9442e5f2d40a.ehealth-actorid-qns.ehealth.acc.edelivery.tech.ec.europa.eu.60        IN
B-1c918b64390d2fd1456863d71c33a096.ehealth-actorid-qns.ehealth.acc.edelivery.tech.ec.europa.eu.60        IN
```

The role of the SML is to manage the resource records of the participants and SMPs in the DNS. This means that dynamic discovery does not use a single central server to run the discovery interface, with its associated single point of failure, but uses DNS, instead, to make it highly resilient.

The deployment infrastructure of the eDelivery SML Service relies on an internal DNS server configured with Domain Name System Security Extensions (DNSSEC). The records are then replicated in the public DNS. Since eDelivery interfaces with the global DNS system, dynamic discovery can virtually operate 24/7/365.
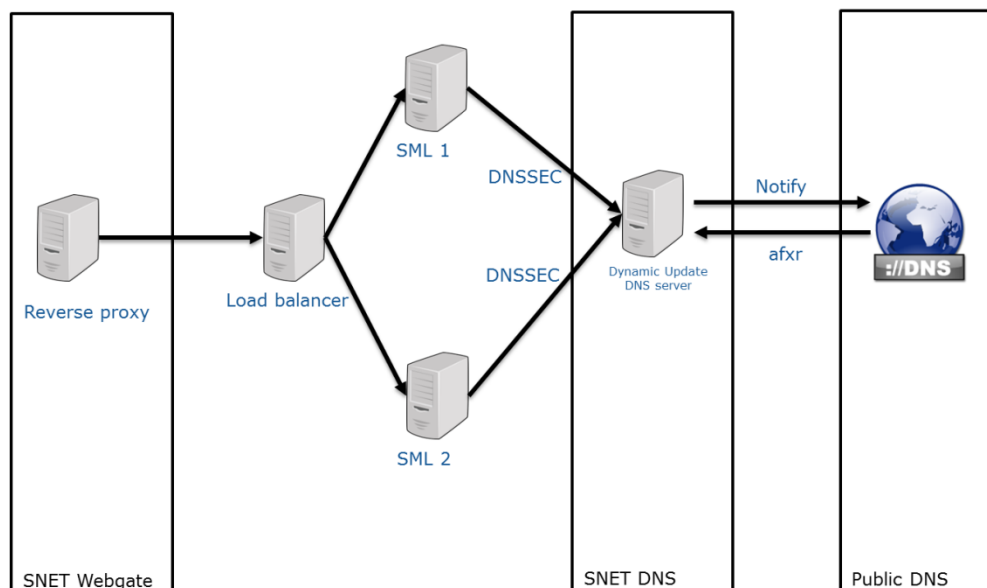
The eDelivery SML Service is deployed on two different environments:

Terminology	Definition
SML	Service Metadata Locator (Production) Base URL for the environment is: SML - Production: https://edelivery.tech.ec.europa.eu/edelivery-sml/
SMK	Service Metadata locator (Acceptance). This environment will only be used for testing purposes. Base URL for the environment is: SMK - Acceptance: https://acc.edelivery.tech.ec.europa.eu/edelivery-sml/

1.2. Users

The eDelivery SML service is intended for the following type of users:

- **Service Providers**: may offer services (such as SMP services) to integrate national backend systems with the eDelivery SML Service or install and operate an eDelivery SML Service.

- **Policy Domain Owners:** decide together with IT architects on whether to use dynamic or static discovery and whether to make it fully distributed or centralised.

1.3. Scope

Policy Domain Owners who subscribe to use SML Services will have their eDelivery DNS subdomain. For example, e-Health is a Policy Domain and ehealth.edelivery.tech.ec.europa.eu is a eDelivery DNS subdomain of e-Health. The scope of the eDelivery SML Service is:

- Centrally operate the SML service as a 'shared service' to manage DNS records of the participants and SMPs in the DNS.

- Explain to the Policy Domain Owners the process of adding a new eDelivery DNS subdomain.

eDelivery Component	Description of the component	In scope of the service
Service Metadata Locator (SML)	The SML enables the Sending Access Point to dynamically discover the IP address of the Receiving Access Point. Instead of looking at a static list of IP addresses, known as static discovery, the sending Access Point consults a Service Metadata Publisher (SMP) to retrieve the IP addresses of the receiving Access Point. The specifications implemented are: - SML specifications - SMP specifications	The Training and Deployment services are described in the Training and Deployment Service Offering Document

1.4. Benefits

The eDelivery SML Service has been designed to generate a list of benefits to the users of the service:

- Dynamic, global and centralized information management about the participant's SMP location on a Domain Name System (DNS) out of the box;

- Well established processes and procedures supported by the eDelivery Support office;

- Scaling up of message exchange infrastructures with hundreds or even thousands of participants.

2. ROLES AND RESPONSIBILITIES

This section describes the main roles in the eDelivery SML Service and their responsibilities.

The following table summarises the split of roles and responsibilities between the different actors in the eDelivery SML Service process in the form of an RACI matrix where:

- **Responsible (R):** indicates the entities that perform the process-step. Every process-step has at least one responsible entity. Responsibilities can also be shared.

- **Accountable (A):** indicates the entity that is ultimately accountable for the process-step. Every process-step has only one accountable entity.

- **Consulted (C):** indicates the entities that give feedback or are consulted during the process-step. This is a two-way process. Not every process-step has an entity that is being consulted.

- **Informed (I):** indicates the entities that needs to be informed about the results of the process-step. This is a one-way process. Not every process-step has an entity that is being informed.

The services are described in detail in Section 3.

- S1 – Creation of a eDelivery DNS subdomain for Policy Domain Owners

- S2 – Management of SMPs and participants

- S3 – Operate and monitor SML Services

- S4 – Maintenance

Service	Entity Role			
	Service Provider	eDelivery Support	Policy Domain Owner	eDelivery Technical Team
S1: Creation of a eDelivery DNS subdomain for Policy Domain Owners				
Step 0: Prerequisite			RA	
Step 1: Registration		RA	R	
Step 2: Execution		RA	I	
Step 3: Create eDelivery DNS subdomain		I		RA
S2: Management of SMPs and participants				
Step 0: Prerequisite	RA		R	
Step 1: Call the Web services exposed by the SML/SMK	R	AC		C
S3: Operate and monitor SML Services	I	RA		
S4: Maintenance	I	RA		

2.1.1. Service Provider

Role: User of the eDelivery Service Metadata Locator (SML)

Responsibilities:

- Requests the services of the respective PKI service provider to get the valid certificates and identifier for the SMP.Set up the SMP to invoke the web services exposed by SML/SMK.

2.1.2. eDelivery Support

Role: Second line support

Responsibilities:

- Register, classify, investigate, escalate if needed, resolve and close tickets.
- Manage the availability and capacity monitoring of the SML services.
- Act as the technical single point of contact to the Service Provider, Policy Domain Owner and provide support during the connection to the SML Services.

2.1.3. eDelivery Technical Team

Role: Third line support and technical support

Responsibilities:

- Maintain the SML sample implementation.
- Create the eDelivery DNS subdomain.

2.1.4. Policy domain Owner

Role: policy domain owner and first line support

Responsibilities:

- Request the service and provide the necessary information for the registration, planning and execution of the service.
- Read the eDelivery SML GTC (General Terms and Conditions) document available on the eDelivery SML service page and send to the eDelivery support a written agreement with the terms and conditions.
- Provide first line support to the users for policy-related matters.
- Setup the PKI service and select a PKI service provider to deliver the certificates.

Provide the eDelivery Support with the details (Name of the Project, Root CA).

3. How to use the service step by step

This section describes the processes that are part of the eDelivery SML Service:

- S1 – Creation of a eDelivery DNS subdomain for Policy Domain Owners
- S2 – Management of SMPs and participants
- S3 – Operate and monitor SML Services
- S4 – Maintenance

3.1. S1 - Creation of a eDelivery DNS subdomain for Policy Domain Owners

The figure below presents an overview of the main steps of the creation of a eDelivery DNS subdomain for Policy Domain Owners process. Each of the process steps is described in more detail in the next sections.

3.1.1. Step 0: Prerequisite

For SML, it is assumed that the Policy Domain Owners have already passed the acceptance tests.

Purpose: To make sure that the acceptance (SMK) tests are successful before going in SML Production.

Actors:

- Policy Domain Owner (e.g. OpenPEPPOL)

3.1.2. Step 1: Registration

Purpose: Register the service request and exchange the necessary information and documentation to set up a new eDelivery DNS subdomain on the SML.
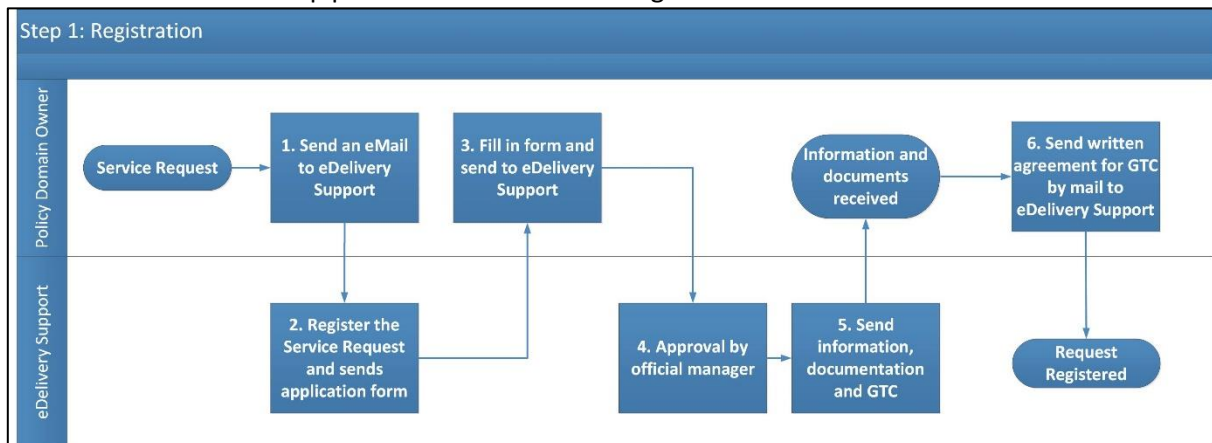
Actors:

- Policy Domain Owner
- eDelivery Support

Process:

1. The Policy domain owner sends a secured email (SECEM) to the eDelivery Support to request the eDelivery DNS subdomain in SML/SMK. The request should contain the following information:
   - Project Name
   - Details on the trusted root certificate authority
2. The eDelivery Support registers the service request and sends to the Policy Domain owner the application form to be filled for the new SML domain creation request (see 4 - Subdomain registration form for eDelivery SML Service).
3. The Policy domain owner fills in the form and sends it back to eDelivery Support.
4. eDelivery Support sends the request for approval to the official manager for approval.

5. Once the request has been approved, the eDelivery Support provides information and documentation to the Policy Domain Owner. This information includes:
   - SLA Manager Service Document
   - Interface Control Document
   - SML Service Offering Description (this document)
   - SML General Terms and Conditions document (SML GTC)
6. The Policy Domain Owner reads the SML GTC document (the GTC is available on SML Service) and sends a written agreement with the terms and conditions to the eDelivery support.

The overview of the set-up process is shown in the diagram below.

3.1.3. Step 2: Execution

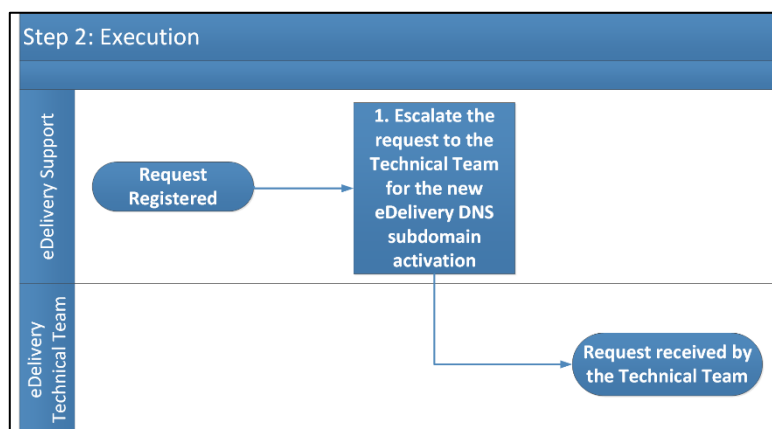**Purpose:** Execute the request for adding a new eDelivery DNS subdomain.

Actors:

   - eDelivery Support
   - eDelivery Technical Team

Process:

1. Escalate the request to the eDelivery Technical Team for the new eDelivery DNS subdomain activation.

The overview of the Process Request process is shown in the diagram below.

3.1.4. *Step 3: Create eDelivery DNS subdomain*

**Purpose:** To activate the new eDelivery DNS subdomain of the Policy Domain Owner.

Actors

- eDelivery Technical Team
- eDelivery Support

Process:

1. Resolution of the Request by the eDelivery Technical Team.

2. The eDelivery Technical Team informs the eDelivery Support of the resolution of the request.

3. The eDelivery Support informs the Policy Domain Owner.

The overview of the create eDelivery DNS subdomain process is shown in the diagram below.
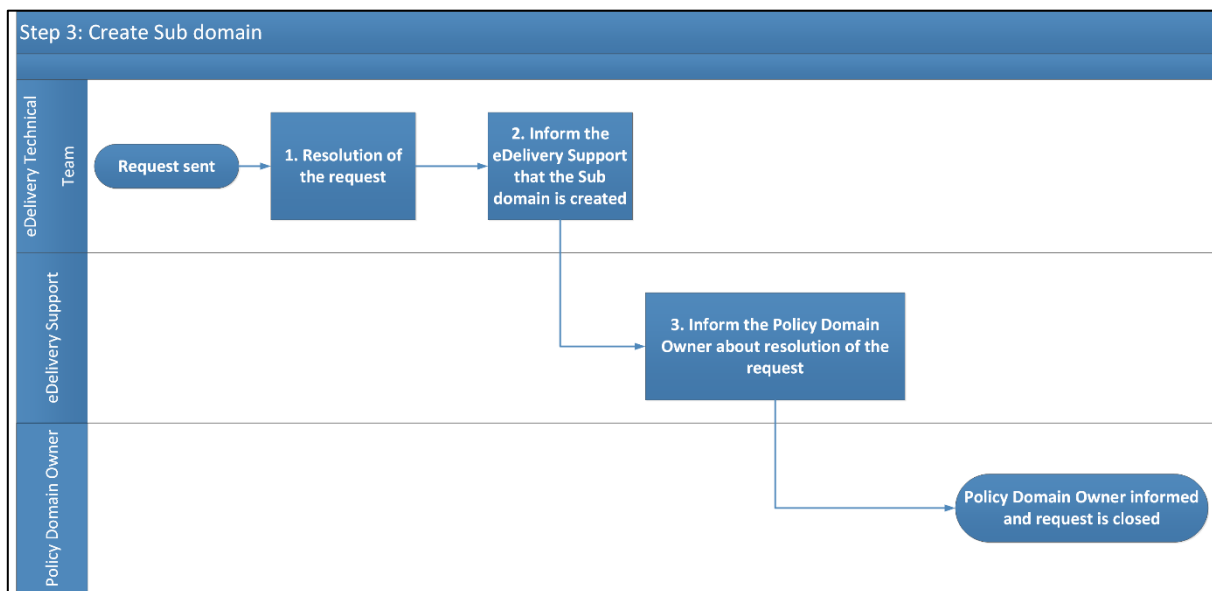
3.2. S2 - Management of SMPs and participants.

The diagram below represents an overview of the main steps of the Management of SMPs and participant's process. The process is described in detail in the following section.

3.2.1. Step 0: Prerequisite:

It is assumed that the Service Providers already have the valid certificate(s) and Identifier for SMP.

The Service Provider has to contact the Policy Domain Owner to get the certificate(s).

Purpose: Register the Service Provider with corresponding Policy Domain Owner and get the certificates for respective environment (Production – SML, Acceptance – SMK).

Actors:

- Service Provider

- Policy Domain Owner (e.g. OpenPEPPOL)

3.2.2. Step 1: Call the Web services exposed by SML/SMK

Purpose:

- To create, read, update or delete SMP in SML/SMK.

- To create, create list, delete, delete list, prepare to migrate Participant in SML/SMK.

Actors:

- Service Provider

- eDelivery Support

Process:

1. Call the web services exposed by SML/SMK (for more details *see the Interface Control Document for SML*.

2. Contact the eDelivery Support, by e-mail or by phone, in case of an issue (*See Contact Information*):

   - eDelivery Support creates a ticket.

   - eDelivery Support provides the required support/documentation to the Service Provider.

3. If the operation is successful, the DNS is updated.

The overview of the process Call to the Web services exposed by SML/SMK as shown in the diagram below.

The eDelivery Support is available for any technical question.
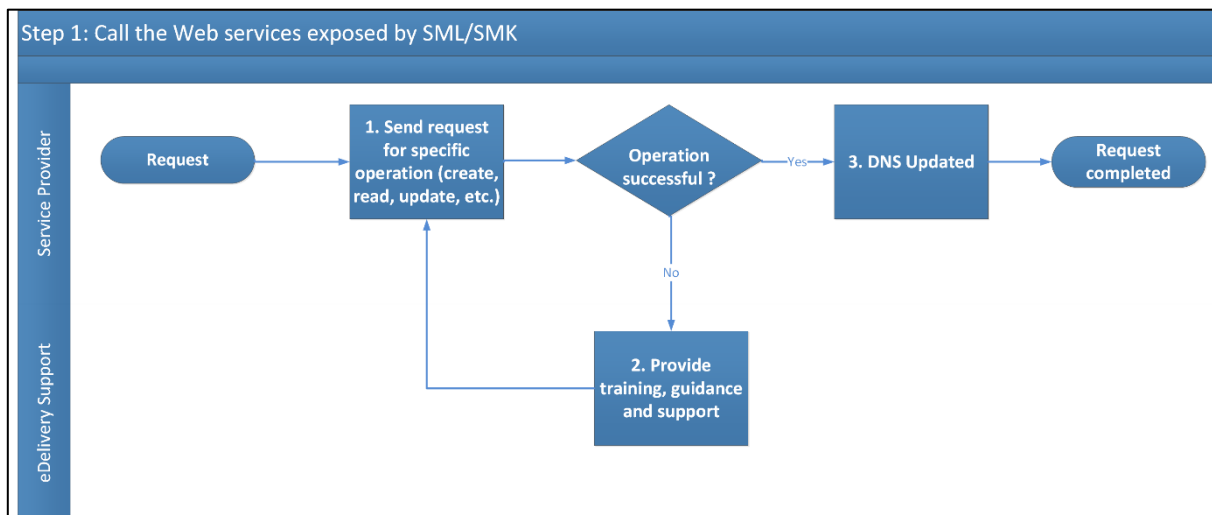
3.3. S3 – Operate and monitor SML Services

Purpose: Operate and monitor the eDelivery SML Service.

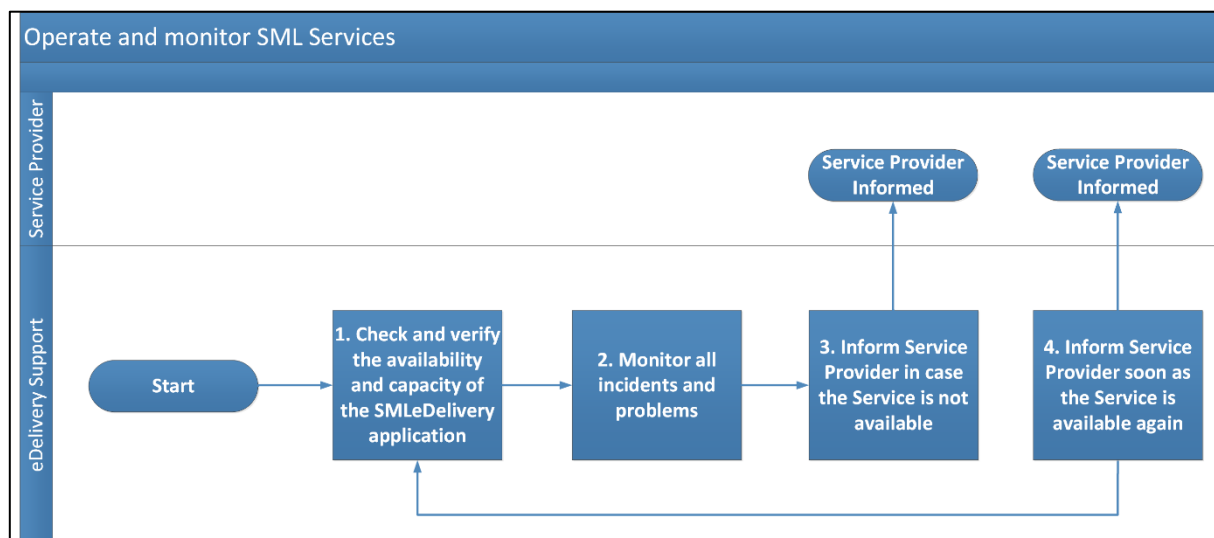**Actors:**

- Service Provider
- eDelivery Support

Process:

1. Check and verify the availability and capacity of the eDelivery SML Services through continuous automated monitoring.

2. Incidents and problems detected during the monitoring process are captured and handled through the Service Desk process.

3. Inform the Service Provider in case the Service is not available because of an unplanned maintenance.

4. Inform the Service Provider as soon as the Service is available again.

Remark:

Check the SML Service Level Arrangement for more detailed information regarding the Service Level Targets to the eDelivery Service SML Service.

The overview of the Monitoring process is shown in the diagram below:

3.4. S4 - Maintenance

Purpose: Maintenance of the eDelivery Service.

**Actors:**

- Service Provider
- eDelivery Support

Process:

1. eDelivery Support receives, internally, information regarding a planned maintenance.

2. Inform the User of the planned maintenance.

Remark:

Check the SML Service Level Arrangement for more detailed information regarding the Service Level Targets to the eDelivery Service SML Service.

The overview of the Maintenance process is shown in the diagram below:
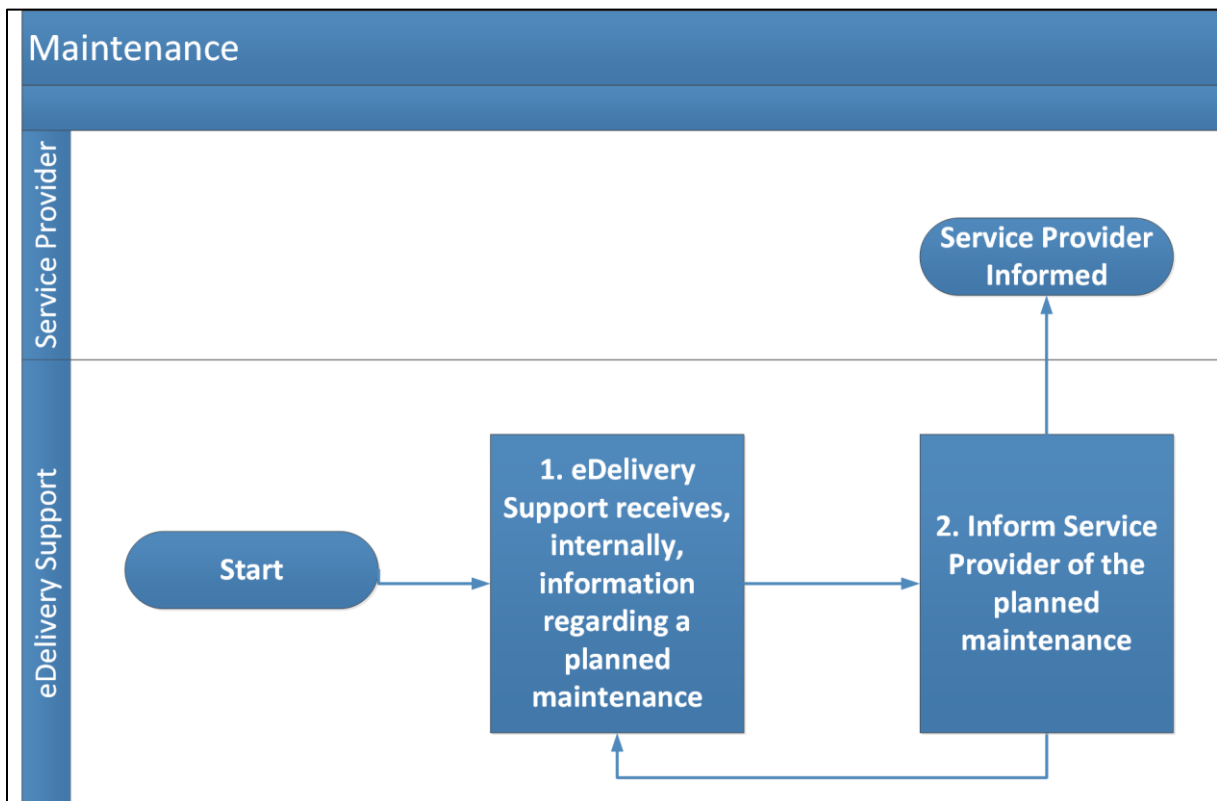
4. SUBDOMAIN REGISTRATION FORM FOR EDELIVERY SML SERVICE

Subdomain registration form for eDelivery SML Service

- **Your project/company**
  - o Name:
  - o Introduction:
  - o Main profile:
  - o The type of documents intended to be exchanged via eDelivery in you network:
- **Subdomain names for integration into SML's DNS zones [unique business-domain or project or company name]**
  - o [   ].(acc.)edelivery.tech.ec.europa.eu
    (e.g.: MyCompany.acc.edelivery.tech.ec.europa.eu for ACC + MyCompany.edelivery.tech.ec.europa.eu for PROD)
- **Approximate starting date of**
  - o Production:
  - o Acceptance:
- **Allowed SMP URL Scheme**

  ☐ HTTP
  ☐ HTTPS
- **Optional restricting pattern for Participant Id in your SML subdomain with regular expression:**
- **PKI service/provider for Production SMP certificates**

  ○ World-wide accepted, trusted CA provider with public CA service
  ○ eDelivery PKI Service
    The certificate service provider is eDelivery team via 3rd partner CA (only for public administrations) Service description.
- **PKI service/provider for Acceptance SMP certificates**

  ○ Same PKI service will be available as the one planned for PROD
  ○ eDelivery Support providing temporary test certificates
- **Domain authorization structure**

  ○ Certificate-based domain authorization
    Domain member will be authorized by the certificate of the SMP.
    Recommended in the case of one or few planned SMPs.
  ○ Certificate-issuer-based domain authorization
    Domain member will be authorized by the certificate issuer of the SMP certificates.
    Recommended in the case of large number of planned SMPs.
    The chosen CA provider must have policy, which ensure that some values in the certificate subject DN are unique and assignable to only one client! (e.g.: OU=MyUniqueID)

- **Restricting pattern for subject DN of the SMP certificate:**
  *It is mandatory if you choose issuer-based authorisation above! (e.g.: ^.*OU=MyUniqueID.*$)*

- **The SMP certificates together with the Root and Intermediate CA certificates (in the case the chosen service is not eDelivery PKI or eDelivery Support test certificate)**
  [files needed to be sent to eDelivery Support: SMP certificate + whole certificate chain]

- **Approximately how many SMP are you planning to implement in your subdomain?**
  - o Production:
  - o Acceptance:
- **The estimated number of Participants intended to be published**
  - o in the next 6 months
    - ▪ Production:
    - ▪ Acceptance:
  - o in the next 2 years:
    - ▪ Production:
    - ▪ Acceptance:
  - o in the long-term:
    - ▪ Production:
    - ▪ Acceptance:

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5. TERMS AND CONDITIONS

The general terms and conditions of the Building Blocks can be consulted in the Master Service Arrangement, available on the Digital Web Portal:

https://ec.europa.eu/digital-building-blocks/wikis/display/DIGITAL/Master+Service+Arrangement

The terms and conditions specific to the eDelivery SML Service are described in the table below.

Term / Condition	Description
Obligations of the Service Provider and Service Domain Owner	It is the responsibility of the Client to ensure that sufficient information and documents are given in due time to enable the required services to be performed; But also to make sure the prerequisites are met.
Delivery of the services	The European Commission will provide the SML services using reasonable care and skill and in accordance with the technical specifications and procedures outlined in this document. The timing of completion of the eDelivery SML services is based on best effort. The European Commission is entitled to suspend or terminate the provision of the services in case of failure of the Client to comply with its obligations, as described above, or any other conditions preventing the successful delivery of the service.

6. LIMITATION OF USE

The SML service provided by the eDelivery building block is provided to assist projects in their early stages (piloting and early, non-critical production) and not to support long-term operations or provide mission-critical infrastructure. As such, the European Commission cannot be held liable for any negative impact the service unavailability, deterioration or malfunction may cause to the SML Domain Owner or to other participants in the domain. The service is provided on a best effort basis, with support available only during Commission business hours (please consult the document eDelivery SML Service level arrangement[3] for details).

The SML (sub)domain is allowed to contain a maximum of one hundred thousand participants. Once this limit is reached, addition of further participants will be disabled for all SMPs operating in the domain (or, alternatively, excess participants will be removed on a regular basis). A domain requiring more than one hundred thousand participants will have to relocate to a different service or a self-hosted SML instance.

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[3] https://ec.europa.eu/digital-building-blocks/wikis/display/DIGITAL/SML+service

7. PRIVACY STATEMENT

The eDelivery privacy statement for the SML service is available here:

[eDelivery SML service privacy statetement](#).

8. CONTACT INFORMATION

eDelivery Support Team

By email: CEF-EDELIVERY-SUPPORT@ec.europa.eu

Support Service: 8am to 6pm (Normal EC working Days)