AIRTEL ENTERPRISE ARCHITECTURE

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Enterprise On-Boarding

IQ - SMS

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Executive Summary

All the TSP's have been mandated to comply to the TCCCPR regulation of 2019 by TRAI. In regards to the same, there are several changes which have been triggered in the way the A2P SMS business is being performed. Below are the key aspects for which information will be provided in this document:

- High level IT architecture and changes in the processes for Airtel
- Structure of the preference scrubbing model
- How TM's can get onboarded – moving from old world to new
- FAQ's

This will be a running document with multiple versions with information being added and updated with every new release.

High Level Architecture

There is a mandate from TRAI to implement a blockchain based distributed ledger for all TSP's. Airtel has built a DLT platform based on Hyperledger V1.4 to comply to the mandate – which effectively has given rise to a new system in the flow.

Airtel IQ has a combination of multiple protocol adapters tightly coupled with the DLT scrubbing engine. The protocol adapter gives flexibility to the TM's to push their messages via Airtel using any protocol of their choice out of the options provided and DLT will provide the compliance to the regulation as well as the data security. The new architecture will be as below:

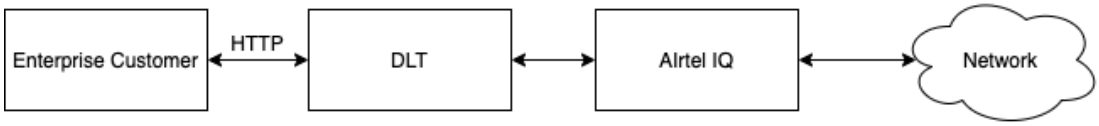

Figure 1: Architecture

DLT Registration and Scrubbing Model

DLT on-boarding Process:

Registration of principal Entity

https://www.youtube.com/watch?v=ZOtG3JNphJc

Registration of Headers

https://www.youtube.com/watch?v=bVDw2ylgv_o

Registration of Headers

https://www.youtube.com/watch?v=bVDw2ylgv_o

Registration of Content Template registration

https://www.youtube.com/watch?v=ZEnf_U0UOyk

For any other DLT help (Consent, template guidelines)

https://www.airtel.in/business/commercial-communication/help

For understanding the preference scrubbing model, we would need to establish certain definitions and their inter-relationships.

Note: The terms 'Sender', 'Entity' and 'Principal Entity' will be used interchangeably in this document depending on the context however they mean the same

Terms	Definition and Remark
Transactional	Check for Sender registration, header registration and template
Service Implicit	Check for Sender registration, header registration and template
Service Explicit	Check for Sender registration, header registration, check for consent and template If the consent scrub fails then preferences will be checked w.r.t Fully Block. If preference scrub passes (i.e. Customer is not on FULLY BLOCK) then the message will be delivered. If both of these fail (i.e. Customer is on FULLY BLOCK), message will not be delivered.
Promotional	Check for Sender registration, header registration, check for consent and template If the consent scrub fails then preferences will be checked. If preference scrub passes then the message will be delivered. If both of these fails, message will not be delivered.
Government	Check for Sender registration, header registration and template Only government approved headers will be accepted. Government headers are approved by TRAI.

Terms	Definition and Remark
Sender/Principal Entity	As per the regulation – the definition is: "The person or entity who owns the telephone number or the header(s) that were used. A person or entity that publicly asserts or uses a Calling Line Identity (CLI) or the phone number(s) referred to in the communication, except where such assertion is fraudulent The person who sent the message or made a voice call, caused the message to be sent or the voice call to be made or authorized the sending of the message or making of the voice call The person or legal entity dealing with goods, or services, or land or property, or a business or investment opportunity that is offered or promoted; except where such entity maintains a distinct legal identity for the division or line of business dealing with offered goods, services or opportunity, in which case such division or line of business" Interpretation for implementation: • When they will register on DLT – they will be given a unique ID – **"Principal Entity ID (PE ID)"** • Have one category from the categories listed in the preference regulations (e.g. Real Estate, Health, Education etc.). An Entity can have association with only one type of category of business • Entity will own Headers, Registered Templates
Header/CLI	• Header can be associated to Entities only and not to any TM • Header can be of two categories – Promotional or Others • Others will encompass – government, stocks, transaction, service etc. all types of headers which are not promotional
Content Template (Script)	• This is the message text that the sender wishes to send to the subscriber. It may contain some fixed part and variable part • Once it is registered on DLT – a unique ID will be associated with this. This ID is called **"Content Template ID"** • Each content template will need to be associated with a header using which it can be sent
Consent	As per regulation - "Consent" means any voluntary permission given by the customer to sender to receive commercial communication related to specific purpose, product or service. Consent may be explicit or inferred as defined in these regulations Interpretation for implementation: There are total of three separate processes associated with consent: • Consent Acquisition: process where the subscriber or the sender will initiate a consent acquisition process. The process will be initiated with bulk consent upload – other channels will be enabled subsequently • Consent verification: process via which the TAP will verify the consent acquisition request received – Verification will be done by TAP • Consent scrubbing: check whether the customer has provided the consent to the entity or not • Consent will be stored in hashed format and encrypted format on DLT for added security measure

Terms	Definition and Remark
Consent Template	Means a template of content which is presented to the customer while acquiring his consent and clearly mentions purpose of the consent and details of sender When consent template is approved, consent template ID will be generated from DLT. When the subscriber gives the consent using the consent verification process, the consent template ID used to acquire it will be associated with the subscriber. This association of the consent template ID will be checked with the MSISDN for sending the message.
Preferences	Definition as per Regulation: "Means preference exercised by the customer to permit only a selected category of commercial communications out of available choices prescribed by relevant regulations" These preferences will map back to the category of business which the entity has selected during registration.

Figure below provides an understanding of scrubbing framework for preference scrubbing.

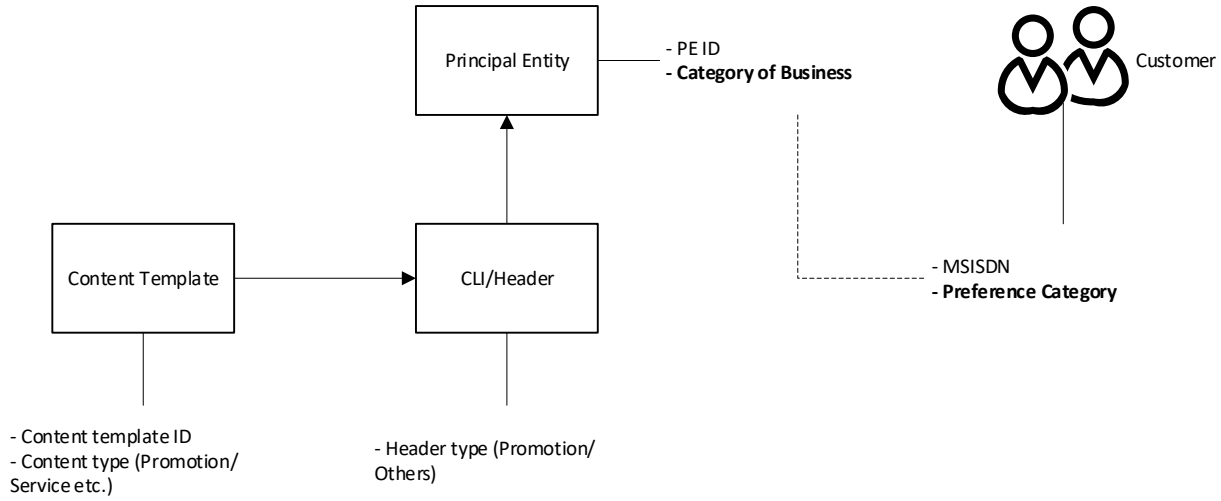

Figure 1: Preference Scrubbing Framework

What will Airtel Need to scrub from Entity?

The list below provides the minimum set needed for scrubbing – the information in parenthesis indicate the new information which is not being sent currently by the entities/PE.

1. PE ID (New)
2. Content Template ID (New)
3. CLI/Header (already part of request)
4. SMS Content (already part of request)
5. TM ID (New) – this is needed for establishing the billing relationship and ensuring authenticity of the Telemarketer.

Sending a Message

How to send a message?

- To Register on DLT to have – PE ID, Content Template ID and approved Header
- For sending the messages, the entity can either approach Airtel directly or come via any of their preferred TM who have connectivity with Airtel.
- Further Customer needs to take IQ facility to send SMS via Airtel.
- Customer needs to whitelist their public IP on Airtel.

HTTP Interface

1. customerId – Customer Id created at Airtel IQ end
2. destinationAddress
   i. It can be array of destination phone numbers in case of ***sendSms*** API
   ii. It can be a String with single destination phone number in case of ***sendSingleSms*** and **sendSmsWithMultipleRequests** API
3. message – Message to be sent
4. sourceAddress – Header Name/Short Address of the SMS
5. messageType – Message Type(PROMOTIONAL/TRANSACTIONAL/SERVICE_IMPLICIT /SERVICE_EXPLICIT
6. entityId – Unique Entity ID registered at DLT end.
7. dltTemplateId – it is the unique Template Id of the provided sourceAddress.
8. otp(optional param) – It is required in case of SERVICE_IMPLICIT message type, as Traffic type can be Transactional or OTP.
   i. If otp is not provided then it will be considered as false and Traffic Type will be Transactional. Same behavior will be replicated if otp is provided with false value.
   ii. If otp is given as true then it will take Traffic type as OTP.
9. file – CSV file to be used while hitting ***sendSmsViaCsv*** API.It can have only one column with destination address without any header. PFA Sample csv file.
10. metaData – It is an optional parameter which will flow end to end i.e. starting from sendSms API to IQ reporting and to Call-backs as well. It is of type Map<String,Object>.

    e.g. - "metaData": {
    "key1": "value1",
    "key2": "value2"
    }
11. Hmac Authentication- This is mandatory Parameter which would verify that the hit is coming from a legitimate source.

1. sendSingleSms API (POST Method): -

This API can be used to send SMS to single destination address only.

Request

Method	URL
POST	https://iqsms.airtel.in/api/v1/send-sms

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Request payload

```
{
   "customerId": "BxxxxJ",
   "destinationAddress": "9xxxxxxxx8",
   "message": "Testing",
   "sourceAddress": "IxxxxO",
   "messageType": " SERVICE_IMPLICIT",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "otp": true,
   "metaData": {
      "key1": "value1",
      "key2": "value2"
   }
}
```

Response

```
{
   "customerId": "BxxxxJ",
   "messageRequestId": "3b30d5fb-6382-4efa-930a-c3352e6bd8c6",
   "incorrectNum": [],
   "sourceAddress": "IxxxxO",
   "message": "Testing",
   "messageType": "SERVICE_IMPLICIT",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "destinationAddress": [
      "9xxxxxxxx8"
   ]
}
```

2. sendSingleSms API(GET Method): -

This API can be used to send SMS to single destination address only.

Request

Method	URL
GET	https://iqsms.airtel.in/api/v1/send-sms

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).

   The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Request payload

```
curl --location --request GET https://iqsms.airtel.in/api/v1/send-sms?customerId=BxxxxJ&destinationAddress=9xxxxxxxxx8&message=Testing&sourceAddress=IxxxxO&messageType=TRANSACTIONAL&entityId=1xxxxxxxxxxxxxxxxxx1&dltTemplateId=xxxxxxxxxxxxx&metaData.key1=value1&metaData.key2=value2'
```

Response

```
{
   "customerId": "BxxxxJ",
   "messageRequestId": "3b30d5fb-6382-4efa-930a-c3352e6bd8c6",
   "incorrectNum": [],
   "sourceAddress": "IxxxxO",
   "message": "Testing",
   "messageType": "TRANSACTIONAL",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "destinationAddress": [
      "9xxxxxxxx8"
   ]
}
```

3. Same Message to multiple Destination: sendSms API: -

This API can be used to send SMS to multiple destination addresses. The maximum count of destination address should be less 10,000. Even though, this api support 10,000 destination addresses for same sms body but realtime processing of SMS submission at network depends on Message submission troughput allotted to client.

Request

Method	URL
POST	https://iqsms.airtel.in/api/v1/send-sms-multi

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Request payload

```
{
   "customerId": "BxxxxJ",
   "destinationAddress": [
      "9xxxxxxxx8"
   ],
   "message": "Testing",
   "sourceAddress": "IxxxxO",
   "messageType": " PROMOTIONAL ",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "metaData": {
      "key1": "value1"
   }
}
```

Response

```
{
   "customerId": "BxxxxJ",
   "messageRequestId": "42175383-b423-4f7b-8c95-9492fa9a8796",
   "incorrectNum": [],
   "sourceAddress": "IxxxxO",
   "message": "Testing",
   "messageType": " PROMOTIONAL ",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "destinationAddress": [
      "9xxxxxxxx8"
   ]
}
```

4. CSV Based Apis : sendSmsViaCsv API: -

This API can be used to send SMS to multiple destination addresses provided in csv file. The maximum count of destination address should be less 10,000

Request

Method	URL
POST	https://iqsms.airtel.in/api/v1/send-sms-csv

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Curl

```
curl --location --request POST https://iqsms.airtel.in/api/v1/send-sms-csv' \
--form 'file=@/Users/abcxyz/Downloads/sms.csv' \
--form 'customerId=BxxxxJ' \
--form 'message=Testing CSV' \
--form 'sourceAddress=IxxxxO' \
--form 'messageType= SERVICE_IMPLICIT' \
--form 'dltTemplateId =xxxxxxxxxxxx' \
--form 'entityId=1xxxxxxxxxxxxxxxxxx1' \
--form 'otp=false'
```

Response

```
{
   "customerId": "BxxxxJ",
   "messageRequestId": "63af58ca-0848-4d84-9729-ce5c70b335cd",
   "incorrectNum": [],
   "sourceAddress": "IxxxxO",
   "message": "Testing CSV",
   "messageType": "SERVICE_IMPLICIT",
   "dltTemplateId": "xxxxxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxx1",
   "destinationAddress": [
      "9xxxxxxx8"
   ]
}
```

5. Bulk Messages: sendSmsWithMultipleRequests API: -

This API can be leveraged to provide multiple requests in single hit. The maximum count of request can be 300. Even though, this api support maximum 300 different individual sms but realtime processing of SMS submission at network depends on Message submission troughput allotted to client based on total number of destination address present in payloads.

Request

Method	URL
POST	https://iqsms.airtel.in/api/v1/send-sms-bulk

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Request Payload

```
[
  {
    "customerId": "BxxxxJ",
    "destinationAddress": "9xxxxxxxx8",
    "message": " Testing",
    "sourceAddress": "IxxxxO",
    "messageType": "SERVICE_IMPLICIT",
    "dltTemplateId": "xxxxxxxxxxxxx",
    "entityId": "1xxxxxxxxxxxxxxxxxx1",
    "otp": true
  },
  {
    "customerId": "BxxxxJ",
    "destinationAddress": "9xxxxxxxx8",
    "message": " Testing",
    "sourceAddress": "IxxxxO",
    "messageType": "TRANSACTIONAL",
    "dltTemplateId": "xxxxxxxxxxxxx",
    "entityId": "1xxxxxxxxxxxxxxxxxx1",
    "metaData": {
      "key1": "value1"
    }
  }
]
```

Response

```
[
  {
    "customerId": "BxxxxJ",
    "messageRequestId": "42175383-b423-4f7b-8c95-9492fa9a8796",
    "incorrectNum": [],
    "sourceAddress": "IxxxxO",
    "message": "Testing",
    "messageType": "TRANSACTIONAL",
    "dltTemplateId": "xxxxxxxxx",
    "entityId": "1xxxxxxxxxxxxxxxxxx1",
    "destinationAddress": [
      "9xxxxxxxx8"
    ],
    "errorMessage": "invalid phone number",
```

```
        "metaData": {
           "key1": "value1"
        }
     },
     {
        "customerId": "BxxxxJ",
        "messageRequestId": "52275383-b423-4f7b-8c95-9492fa9a8296",
        "incorrectNum": [],
        "sourceAddress": "IxxxxO",
        "message": "Testing",
        "messageType": "TRANSACTIONAL",
        "dltTemplateId": "xxxxxxxxx",
        "entityId": "1xxxxxxxxxxxxxxxxxx1",
        "destinationAddress": [
           "9xxxxxxxx8"
        ],
        "errorMessage": "invalid phone number",
        "metaData": {
           "key1": "value1"
        }
     }

  ]
```

6. Content Moderation Send SMS API Curl :-

Method	URL
POST	https://iqsms.airtel.in/api/v1/send-sms-cm?customerId=CUSTOMERID' \

Headers

1. Authorization

   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:

   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l

2. Content-Type: application/json

Sample Request Payload

```
curl --location --request POST 'https:// iqsms.airtel.in/api/v1/send-sms-cm?customerId=CUSTOMERID' \

--header 'x-date: Thu, 17 Jun 2021 02:02:08 GMT' \
--header 'Authorization: hmac username="CUSTOMERID", algorithm="hmac-sha256", headers="x-date",
signature="iIhmNFxbKltfi/+M8O/bbIQ78JbDTipm7TZyq0G6IHE="' \
--header 'Content-Type: application/json' \
--data-raw '{
"customerId": "CUSTOMERID",
"destinationAddress": [
"882989XXXX"
],
"message": "Sample SMS",
"sourceAddress": "ABCD"
}'
```

7. HMAC Authentication instead of Basic Auth

For security reasons, we have added two extra headers in our api which is needed to be passed while calling the api.

1. **x-date** - Current timestamp of your system

e.g : Thu, 08 July 2021 01:44:08 GMT
Note :- The Date should be in GMT and the pattern should strictly be as mentioned in the example above .

2. **Authorization**

   Steps to calculate this :-

   1. Encrypt date header using any of these hashing algorithm (hmac-sha256,hmac-sha384,hmac-sha512). Secret key would be shared in a one to one mail.
      According to the above example string to be encrypted is : **x-date: Thu, 08 July 2021 01:44:08 GMT.** i.e, calculate **hmac-sha256(x-date: Thu, 08 July 2021 01:44:08 GMT) .** Use key as **secret** for now.
   2. Encode the result further by using Base64 encoding taking input type as Hexadecimal.
      For this, it would be Base64 of **24ce27a419a49f5b0e39ddf986ffa5aa1e54f45f4fef0a2fc18b14e5491d55fd** which would be **JM4npBmkn1sOOd35hv+lqh5U9F9P7wovwYsU5UkdVf0=**
   3. Authorization : hmac username="<CUSTOMERID>", algorithm="<HMAC ALGO USED>", headers="x-date", signature="JM4npBmkn1sOOd35hv+lqh5U9F9P7wovwYsU5UkdVf0="

‘

8. UAL sendSingleSms API (POST Method): -

This API can be used to send SMS to single destination address only.

Request

Method	URL
POST	https://iqsms.airtel.in/api/v3/send-sms?customerId=CUSTOMERID' \

Headers

1. Authorization
   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:
   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l
2. Content-Type: application/json
3. customerId : <customerID>

Sample Request payload

```
{
   "customerId": "BxxxxJ",
   "destinationAddress": "9xxxxxxxx8",
   "message": "Testing",
   "sourceAddress": "IxxxxO",
   "messageType": " SERVICE_IMPLICIT",
   "dltTemplateId": "xxxxxxxxx",
   "entityId": "1xxxxxxxxxxxxxxxxxx1",
   "otp": true,
   "metaData": {
      "key1": "value1",
      "key2": "value2"
   }
}
```

Response

```
{
   "messageRequestId": "3b30d5fb-6382-4efa-930a-c3352e6bd8c6"
}
```

9. UAL Content Moderation Send SMS API Curl :-

Method	URL
POST	https://iqsms.airtel.in/api/v3/send-sms-cm?customerId=CUSTOMERID' \

Headers

1. Authorization
   Authorization must be sent with all requests. Basic authentication scheme is used, the credentials are constructed like this:
   - The username and the password are combined with a colon (user:pass).
   - The resulting string is base64 encoded (YWxhZGRpbjpvcGVuc2VzYW1l
2. Content-Type: application/json
3. customerId : <customerID>

Sample Request Payload

```
{
    "customerId": "BxxxxJ",
    "destinationAddress": "9xxxxxxxx8",
    "message": " Testing",
    "sourceAddress": "IxxxxO",
 }
```

Response

```
{
   "messageRequestId": "3b30d5fb-6382-4efa-930a-c3352e6bd8c6"
}
```

NOTE:

- For Promotional Messages there will be no DLR sent back in Standard scenario. However, DLR will be sent back only in the case when there is NACK received from Airtel DLT.
- If the content is wrong and identified by DLT, also CP/Entity/TM will still get a success. Content Matching will be based on the Template ID that is whitelisted over the DLT Portal.
- If DND scrubbing fails at DLT then also CP/Entity/TM will get submit success
- Optional Parameters are mandatory else packet will be rejected.
- MSISDN Length Must be either of 10 or 12 Digits in submission packet.
- Length for all 3 optional parameters should be 12 to19 (Digit in numerical)
- Other standard SMSC error codes also apply

FAQ

Sr. #	Question	Airtel Response
1.	How will the DLT website process work? Is there a minimum number of message limitation from website? Is there a maximum limit?	For the website process, once your login, you will be able to see the scrubbing function on the left side of your screen post which you will need to follow onscreen instructions. There is a minimum limit of 5000 messages. Maximum limit on file is 100,000 SMS records
2.	Can we schedule a message delivery?	Yes, if DLT website is used, you can schedule a message delivery file. The file will be scrubbed few minutes before the scheduled delivery time. You will be notified over email/SMS once the scrubbing process is completed.
3.	Do we get delivery report for promotional messages? Do we get subscriber preference file as we get currently?	No. TRAI has in multiple discussions specified that this information should not be given to TM's
6.	If we do not get delivery report, how will our customers know campaign effectiveness, our commercial model with them is based on delivery SLA?	Delivery reports will not be given for promotional messages. Count of messages will be provided for how many messages have been delivered in total out of a batch.

Appendix A - Glossary of Terms

This table contains a list of any terms that have been used throughout the document.

Term	Description
UCC	Unsolicited Commercial Communication
OAP	Originating Access Provider
TAP	Terminating Access Provider
CoP	Code of practise
DLT	Distributed Ledger Technology
NE	Network Element
TSP	Telecom Service Provider
PE	Principal Entity
TM	Telemarketer
OAP	Originating Access Provider
TAP	Terminating Access Provider
TSP	Telecom Service Provider
WS	Web Service API