



सत्यमेव जयते

भारतीय दूरसंचार विनियामक प्राधिकरण

Telecom Regulatory Authority of India



**Recommendations on
Introduction of Calling Name Presentation (CNAP) Service
in Indian Telecommunication Network**

New Delhi, India

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CHAPTER - I: INTRODUCTION

A. Introduction

- 1.1 India is currently the world's second-largest telecommunications market. There were 1154.17 million wireless subscribers and 31.57 million wireline subscribers in the country as on 30.11.2023. The last two decades have witnessed a remarkable growth in the telecommunication sector in the country.
- 1.2 Since the year 2013, the Government of India has been following a regime of Unified License for the provision of telecommunication services. Eligible entities may obtain appropriate authorization(s) under the Unified License from the Government and provide a range of telecommunication services to their customers. Under the Unified License regime, licensees are mandated to provide Calling Line Identification (CLI). As per the Unified License Agreement, *"Calling Line Identification (CLI) means identity of the calling/ originating subscriber in terms of the telephone number assigned as per E.164¹ of ITU Recommendation/ IP Address or any other identification as may be prescribed by the Licensor from time to time."*
- 1.3 Access service providers in India provide Calling Line Identification Presentation (CLIP) supplementary service, as a part of their bouquet of services to telephone consumers. When a telephone consumer receives an incoming call, the telephone number of the calling party is displayed on the called party's telephone (mobile handset/ landline telephone set), through the CLIP service.
- 1.4 The telephone consumers require that they should be able to correctly identify the calling party. The CLIP service does not adequately meet this requirement as this service presents only the telephone number of the calling party.

¹ E.164 is the international public telecommunication numbering plan, standardized by International Telecommunication Union (ITU).

- 1.5 Telephone consumers, at various fora, have raised a concern that in absence of the calling party name presentation service, they prefer not to attend calls from unknown telephone numbers, as most of such calls are unsolicited commercial communications (UCCs) from un-registered telemarketers. As a result, even genuine telephone calls may go unanswered.
- 1.6 Telephone consumers have also raised their concern in respect of robocalls, spam calls, and fraudulent calls. Robocalls are calls made automatically by IT-enabled systems mainly to financially dupe telephone consumers. Spam calls are unsolicited marketing calls from personal mobile connections, bypassing the do-not-disturb (DND) feature, and targeting a large number of telephone consumers. Through fraudulent calls, certain individuals attempt to obtain details of bank account/ one-time-password (OTP) with an aim to defraud consumers.
- 1.7 At present, smartphone users make use of native smartphone tools and third-party apps to identify the calling party name and mark spam calls. Apple, the manufacturer of iPhones, has a 'silence unknown callers' feature on its mobile handsets. The Google Phone app for Android has a 'caller ID and spam' protection feature that allows phone users to mark incoming calls as spam. Third-party apps like 'Truecaller' and 'Bharat Caller ID & Anti-spam' also provide calling party name identification and spam identification facilities. Generally, native smartphone tools and third-party apps provide name identification services based on crowd-sourced data. However, the crowd-sourced name identity information may not be reliable, in many instances.

B. Calling Name Presentation (CNAP) Supplementary Service

- 1.8 In 1996, International Telecommunication Union (ITU) defined the Calling Name Identification Presentation (CNIP) supplementary service through its Recommendation No. ITU-T I.251.9 (07/96)² on 'Number identification

² Source: https://www.itu.int/rec/dologin_pub.asp?lang=s&id=T-REC-I.251.9-199607-I!!PDF-E&type=items

supplementary services: Calling name identification presentation' as a part of service capabilities in Integrated Service Digital Network (ISDN), as below:

"Calling name identification presentation (CNIP) is a supplementary service offered to the called party which provides the name information associated with the calling party to the called party."

- 1.9 In 2012, European Telecommunication Standards Institute (ETSI) released the technical specification No. TS 122 096 V11.0.0 (2012-10)³ on 'Digital Cellular Telecommunication system (Phase 2+); Universal Mobile Telecommunication System (UMTS); Name identification supplementary services; Stage 1 (3GPP TS 22.096 version 11.0.0 Release 11)'. Through the said technical specification, ETSI defined Calling Name Presentation (CNAP) supplementary service as below:

"The CNAP supplementary service enables the called party to receive the calling name information of the calling party."

- 1.10 A few other parameters defined by ETSI through the afore-mentioned technical specification No. TS 122 096 V11.0.0 (2012-10) are given below:

"The name identity is made up of the following information unit: - The name of the mobile subscriber for the purpose of calling name presentation - up to 80 characters of information associated with a specific calling party. The calling name identity is the name identity of the calling party."

"In addition to or instead of the name identity, the network may give a Presentation Indicator (PI) to the called mobile subscriber of the CNAP supplementary service. The following information may be given: - Presentation Indicator (PI) showing a) presentation restricted, or b) name unavailable. The name identity of a PLMN subscriber shall always be provided by the network."

"Calling Party is the originating party."

"Called Party is the terminating party. The CNAP supplementary service is provided to the called party."

³ Source: https://www.etsi.org/deliver/etsi_ts/122000_122099/122096/11.00.00_60/ts_122096v110000p.pdf

"Calling Name Information of the calling party includes either the calling name identity or an indication of privacy or unavailability."

"CNAP is applicable to all telecommunication services except Short Message service."

- 1.11 In 2021, 3rd Generation Partnership Project 2 (3GPP2) released a technical specification No. 3GPP TS 22.173 V17.3.0 (2021-03)⁴ on 'IP Multimedia Core Network Sub-system (IMS) Multimedia Telephony Service and Supplementary Services; Stage 1 (Release 17)'. Through the said technical specification, 3GPP2 introduced, *inter-alia*, the specifications for Originating Identification Presentation (OIP) as below:

"The OIP service provides the terminating party with the identity of the originating party."

"The terminating service provider shall extract the originating party's telephone number from the originating party identity (e.g., from the tel-URI) to use in its query to retrieve eCNAM identity data from a trusted data source."

C. DoT's Reference dated 21.03.2022

- 1.12 Department of Telecommunications (DoT), Ministry of Communications, Government of India, through the letter No. 20-405/2013-AS-I dated 21.03.2022 (**Annexure-I**), requested Telecom Regulatory Authority of India⁵ (hereinafter also referred to as "TRAI", or "the Authority") to provide recommendations under Section 11(1)(a) of the TRAI Act, 1997 (as amended) on introducing the Calling Name Presentation (CNAP) service in Indian Telecommunication Network. The said reference is reproduced below:

"It has been desired to examine the feasibility of Calling Name Presentation (CNAP) in Indian Telecommunication Network. CNAP is the supplementary service which

⁴ Source: <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=620>

⁵ Telecom Regulatory Authority of India was established in 1997. The Authority is mandated to regulate telecommunication services, protect the interests of service providers and consumers of the telecommunication sector, and promote and ensure orderly growth of the telecommunications sector.

enables the called party to receive the calling name information of the calling party. This supplementary service provides the ability to indicate the name information of the calling party to the called party at call set-up time for all incoming calls.

2. Presently, in Indian Telecom Networks, only the mobile/ landline numbers are being displayed as Calling Line Identification (CLI) during incoming calls. There is no mandate in the license for providing CNAP supplementary services.

3. In Unified License, the Calling Line Identification is defined as: CALLING LINE IDENTIFICATION (CLI) means identity of the calling/originating customer in terms of the telephone number assigned as per E.164 of ITU Recommendation/IP Address or any other identification as may be prescribed by the Licensor from time to time.

4. In view of above, TRAI is requested to submit its recommendations under Section 11 (1) (a) of TRAI Act, 1997 (as amended) on introducing the Calling Name Presentation (CNAP) service in Indian Telecommunications Network.”

- 1.13 Thereafter, through a letter dated 01.06.2022, the Authority requested DoT to provide background notes on introducing the Calling Name Presentation (CNAP) facility in telecom network. In response, DoT, through a letter dated 11.07.2022, provided a background note on the subject. In the note, DoT stated that the introduction of CNAP facility in telecommunication networks aims to empower subscribers to take an informed decision while receiving an incoming call, and to reduce the harassment of subscribers from unknown/ spam callers; in order to facilitate CNAP feature to all telephone subscribers (smartphone and feature phone owners) in India, telecom network readiness and feasibility need to be explored so that CNAP can be implemented in multi-technology networks across telecom service providers without the need for internet or smartphones/ devices; CNAP facility requires inter-telecom service provider coordination and access to a subscriber's name during the call flow. Further, DoT requested the Authority to carry out a consultation process to resolve some of the important issues as mentioned below:
- (a) Inter-service provider subscriber name access mechanism;

- (b) Modification in the call flow process for inclusion of the subscriber's name during call completion;
- (c) Requirement of storage and retrieval of calling party name at terminating network;
- (d) Technology neutral caller name display facility of the telecommunication subscribers;
- (e) Internet independent caller name display facility of the telecommunication subscribers; and
- (f) Delivery of subscriber name to called party without hindering latency of existing call flow mechanism.

D. Consultation process with respect to the DoT's Reference

1.14 With respect to the DoT's reference dated 21.03.2022, the Authority, on 29.11.2022, issued a consultation paper on 'Introduction of Calling Name Presentation (CNAP) in Telecommunication Networks' (hereinafter, referred to as, "CP dated 29.11.2022"), through which a range of issues were raised for soliciting inputs of stakeholders. Written comments and counter comments on the CP dated 29.11.2022 were invited from stakeholders by 27.12.2022 and 10.01.2023 respectively. After considering the request of an industry association for extension of time for submission of comments, the last date for submission of written comments and counter comments were extended up to 17.01.2023 and 31.01.2023 respectively. The Authority received comments from 40 stakeholders and counter comments from five stakeholders. The comments and counter comments are available on the Authority's website www.traai.gov.in. An Open House Discussion (OHD) on the CP dated 29.11.2022 was conducted on 09.03.2023, through virtual mode.

1.15 Based on the inputs received from stakeholders and its own analysis, the Authority has finalized these recommendations. The recommendations comprise three chapters. This chapter provides an introduction and background to the subject.

Chapter-II presents an analysis of the issues based on the comments received from stakeholders and recommendations thereof. Chapter-III provides a summary of the recommendations.

CHAPTER – II: EXAMINATION OF ISSUES

2.1 Through the CP dated 29.11.2022, the Authority solicited comments of stakeholders on broadly the following issues related to CNAP supplementary service:

- (a) Need for introducing CNAP supplementary service in the Indian telecommunication network;
- (b) Need for mandatory activation of CNAP supplementary service for each telephone subscriber;
- (c) Name source to be used for displaying CNAP;
- (d) Technical model for implementing CNAP supplementary service in the Indian telecommunication networks;
- (e) Measures to ensure delivery of the calling party name without increase in call set up time;
- (f) State of readiness of the existing telecommunication networks to support CNAP supplementary service;
- (g) Telephone handset related issues;
- (h) Need for implementing CNAP supplementary service for registered telemarketers and toll-free numbers;
- (i) Need for a 'preferred name' in case of bulk connections; and
- (j) Need for amendments in the provisions of the telecommunication service licenses.

2.2 An analysis of the afore-mentioned issues is presented below.

A. Need for introducing CNAP supplementary service in the Indian telecommunication network

2.3 The Authority, through the CP dated 29.11.2022, solicited comments of stakeholders on the following questions:

- Q1. Whether there is a need to introduce the Calling Name Presentation (CNAP) supplementary service in the telecommunication networks in India?*
- Q2. Should the CNAP supplementary service be mandatorily activated in respect of each telephone customer?*
- Q3. In case the response to Q2 is negative, suggest a suitable method for acquiring consent of the telephone customers for activation of CNAP supplementary service.*

Comments of stakeholders on the Q1

- 2.4 In response to the Q1, broadly, three categories of views have been received from stakeholders. While most of the stakeholders have supported the implementation of CNAP supplementary service in Indian telecommunication networks, a few stakeholders have opined that there is no need to introduce CNAP supplementary service in Indian telecom networks. A few other stakeholders have proposed a middle path – they have suggested that CNAP supplementary service may be introduced in Indian telecom networks in a limited manner.
- 2.5 A broad summary of the comments of the stakeholders, who have supported the introduction of CNAP supplementary service in Indian telecommunication networks, is given below:
- (a) Implementation of CNAP supplementary service will make it easier to trace problematic calls and discourage obscene callers. It will minimize incidents of impersonation, i.e., callers using fake names or claiming to be calling on behalf of some other entity. Therefore, CNAP supplementary service should be implemented to serve the interest of consumers.
 - (b) The digital growth levels have far exceeded the corresponding digital literacy levels in the country. Consequently, there is a prevalence of online payment frauds like vishing, especially where customers are new to the products, or they may unknowingly divulge bank/ credit details. CNAP supplementary service will help in curbing such frauds.

- (c) CNAP supplementary service will benefit legitimate businesses and other genuine callers, as their calls are more likely to be answered. This service will help businesses to boost conversion rates, increase profits, and reduce costs.
- (d) Introduction of CNAP supplementary service will ensure that the name of calling party is disclosed during the call set up phase, thereby increasing the likelihood of the called party accepting such calls. This will, in turn, result in a better utilization of network resources.

2.6 A summary of the comments of the stakeholders, who are of the view that CNAP supplementary service should be introduced in telecom networks in a limited manner, is given below:

- (a) For implementation of CNAP, an opt-in, intra-network, consent based framework should be established. The consumers who do not opt to share their names should not be able to receive the CNAP supplementary service.
- (b) Today, a very large number of entities are indulged in unsolicited commercial communication (UCC) and spam. CNAP supplementary service can address incessant spam and UCC. Therefore, the primary target of CNAP supplementary service should be telemarketing/ A2P calling, which is the major driver of spam volume today.
- (c) The need to introduce CNAP supplementary service should be looked at holistically, with detailed examination of intricate areas related to technical, privacy and other issues, cost-benefit analysis, alternate ways to meet the objective and existing regulatory norms for achieving the objective. Considering all such concerns, implementation of CNAP should be optional for telecom service providers.

2.7 A broad summary of the comments of the stakeholders who are not in favour of introducing CNAP supplementary service in telecom networks, is given below:

- (a) CNAP supplementary service potentially violates an individual's privacy, as it would reveal the caller's name to the receiver without the caller's consent.

CNAP supplementary service can only be begun to be considered in India once comprehensive privacy laws are in place.

- (b) Current third-party apps effectively solve customer concerns. Such apps also take user information on callers being spammers. They provide clear and meaningful information to consumers for making an informed choice about accepting or rejecting a call from an unknown number. Implementation of CNAP supplementary service will have limited additional benefits. It will add to the regulatory burden and costs of telecom service providers. The Government should instead look to improve anti-spam regulation.
- (c) CNAP is generally an LTE feature and there are no standards for its implementation over 2G and 3G networks. The nodes of legacy networks (supporting 2G/ 3G) are on the verge of end-of-service (EoS) and end-of-life (EoL). Original Equipment Manufacturers (OEMs) have no roadmap or support systems for development on these nodes. Therefore, such nodes may not support CNAP development and deployment. These nodes will be replaced over a period, due to huge cost implications. A preliminary assessment indicates the cost to be close to Rs. 100 crore. Further, there are no foreseeable revenues which can be generated from this service. Any implementation of CNAP over 2G and 3G networks is full of uncertainty and would need detailed testing before implementation.
- (d) While the CNAP proposal is well intended to address the issue of unsolicited and fraudulent calls, it may not serve to achieve these objectives, and potentially raise new concerns. The telecom service providers (TSPs) will have to incur financial costs for enhancement of systems and networks for implementing CNAP. These costs will be substantial and may not be proportionate to the anticipated outcomes.

Comments of stakeholders on the Q2

- 2.8 In response to the Q2, three categories of views have been received from stakeholders. While a few stakeholders have opined that CNAP should be activated

in respect of each telephone subscriber, a few others have opposed mandatory activation of CNAP in respect of each telephone subscriber. Some stakeholders have proposed that CNAP should be activated in a phased manner.

2.9 A broad summary of the views expressed by the stakeholders who have supported mandatory activation of CNAP for each telephone customer is given below:

- (a) All subscribers are troubled by spam and fake calls. Educating millions of telecom subscribers to activate such a measure will be a never-ending process and involve a huge amount of effort by all concerned agencies. Mandatory activation also eliminates the process of obtaining consent with the consequent economic costs. Therefore, there is no downside to mandatory activation for subscribers.
- (b) In case the CNAP supplementary service is made optional, then the scammers will opt out there by defeating the very purpose of this service. It should be mandatory and should be turned off only if there is a court order for cases like a sensitive person/ witness.

2.10 The comments of the stakeholders, who have suggested that CNAP supplementary service should be activated in a phased manner, are summarized below:

- (a) Initially CNAP supplementary service should be implemented as an optional value-added service (VAS), in which customers are allowed to use their preferred name, commercial name, public institution or non-governmental organization name, trademark etc. After analyzing the response to the service and the time required to update/ upgrade the legacy networks, the decision regarding mandatorily activating CNAP supplementary service on each customer may be taken.
- (b) To contain spam calls, CNAP supplementary service should be implemented for commercial entities/ telemarketers in an expeditious manner. Based on the number of calls and proportion of outgoing calls, telephone numbers should be blocked unless they register under the CNAP supplementary service. Based on the learnings of the A2P implementation, a long-term

roadmap may be prepared for implementation of CNAP supplementary service for P2P calls.

2.11 A broad summary of the views of stakeholders who have opposed the mandatory activation of CNAP supplementary service for each telephone customer is given below:

- (a) 'Name' is a confidential data for a subscriber and there would be a segment of subscribers who would not want their names to be shared. Therefore, the consent of subscribers must be taken before activating CNAP. CNAP should be introduced as a voluntary 'opt-in' service and should not be mandatory for users. It should be available to those who demand it.
- (b) There could be a variety of reasons for the calling party not preferring to share its name like risk to property and life, witness protection, whistleblower protection etc.

Comments of stakeholders on the Q3

2.12 In response to the Q3, many stakeholders have provided their views on the method of acquiring the consent of telephone subscribers for sharing their name information with the called party. Broadly, the stakeholders have suggested the following methods for obtaining the consent of telephone subscribers:

- (a) Through SMS short code, in a manner similar to the existing consent mechanism for activation of value-added services (VAS);
- (b) Through interactive Voice Response System (IVRS);
- (c) Through telecom service provider's app (wherein customers can 'opt-in' or 'opt-out' from CNAP supplementary service);
- (d) Either digitally or physically, as part of the activation process, at the time of activation of a new connection; and
- (e) A mechanism like the opt-in/ opt-out under the Telecom Commercial Communication Customer Preference Regulations (TCCCPR), 2018.

Analysis w.r.t. the Q1, Q2 and Q3

2.13 While analyzing the inputs received from stakeholders, the Authority took note of the following aspects:

- (a) Under the current regulatory framework, telemarketers, who are registered with access service providers, are permitted to make commercial calls to telephone subscribers through 140-level series number. Consumer can block all commercial communications (calls and SMSs both) or can selectively block unsolicited commercial communications (UCCs) from specified seven categories- (a) Banking/ insurance/ financial products/ credit cards; (b) Real Estate; (c) Education; (d) Health; (e) Consumer goods and automobiles; (f) Communication/ Broadcasting / Entertainment/IT; and (g) Tourism and leisure by registering his/ her preference in National customer Preference Register (NCPR) also known as DND Registry⁶. As most of telephone subscribers have registered their preference for blocking all commercial communications, many telemarketers have started calling telephone subscribers for the purpose of marketing and promoting their products and services from personal telephone connections (10-digit number), instead of the 140-level series numbers, designated for registered telemarketers. Since unwanted calls can be annoying, and a waste of people's time, the victims of the unsolicited commercial calls (UCCs) made by unregistered telemarketers are likely to experience anxiety and emotional distress. Consequently, many telephone users prefer not to attend calls from unknown telephone numbers. As a result, even genuine calls may go unanswered.
- (b) In the recent past, many online payment frauds through 'vishing' have been noticed in the country. Vishing is a fraudulent use of phone calls using social engineering techniques to convince individuals to reveal private information such as bank details and passwords, especially where customers are new to the products, or they may unknowingly divulge bank/ credit details.

⁶ Source: <https://www.trai.gov.in/faqcategory/unsolicited-commercial-communicationsucc>

- 2.14 The Authority is of the view that the menace of fraudulent calls, unwanted spam calls etc. will be largely curbed if telephone consumers can identify the calling party at the time of receiving the call.

The present method of identification of calling party

- 2.15 At present, all access service providers in India provide Calling Line Identification Presentation (CLIP) supplementary service, as a part of their bouquet of services to telephone consumers. When a telephone consumer receives an incoming call, the telephone number of the calling party is displayed on the called party's telephone (mobile handset/ landline telephone set) through the CLIP service. In other words, for identifying the calling party before answering an incoming call, a telephone consumer gets the telephone number of the calling party from its access service provider. To put it differently, in respect of telephone calls, only the telephone number serves as the identity of the calling party in India, at present. However, as the telephone number is a mere string of digits, it, when used alone, provides little or no help to the called party in identifying the calling party.
- 2.16 The Authority notes that through the recommendation No X.1252 (04/2021)⁷ on 'Baseline identity management terms and definitions', ITU has defined 'identity' as *"[a] representation of an entity in the form of one or more attributes that allow the entity or entities to be sufficiently distinguished within a context."* Further, the Authority notes that in the report No. FG-DCS (01/2017)⁸ on 'Identity and Authentication', ITU has provided a range of meanings for the term 'identity' where 'name' is the foremost attribute of identity.

⁷ Source: <https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14642&lang=en>

⁸ https://www.itu.int/en/ITU-T/studygroups/2017-2020/09/Documents/ITU_FGDFS_Report_IdentityandAuthentication.pdf

Evolution of calling line identification

- 2.17 In the early part of the evolution of telecommunication systems in India, only the wireline (landline) telephony service was available to telephone consumers. The wireline telecommunication networks comprised of analogue telephone exchanges (such as strowger exchange, cross exchanges etc.), and telephone consumers used only the plain old telephone sets. At that stage, neither the telecommunication networks had the capability to make available the calling line identification to the called party, nor the telephone sets had the ability to display such identification.
- 2.18 In the period from the early 1980s to early 1990s, digital landline telephone exchanges were inducted in various parts of the country. In the year 1994, the cellular mobile telephone service was introduced in the country. Meanwhile, in the year 1993, ITU issued its recommendation No. Q731⁹ on number identification supplementary service. Through this recommendation, ITU defined calling line identification presentation (CLIP) as *"a supplementary service offered to the called user which provides the calling user's number, with additional address information (e.g. calling party sub-address) if any, to the called user."* Digital wireline telephone networks and cellular mobile telephone networks had the capability to support CLIP supplementary service. Thus, in the 1990s, the telephone consumers in India got the facility of identification of the calling party, through the presentation of the telephone number of the calling party.
- 2.19 In the year 1996, ITU through its recommendation No. I.251.9 defined 'calling name identification presentation' under 'number identification supplementary services'. Through the said recommendation, ITU defined calling name identification presentation (CNIP) as *"a supplementary service offered to the called party which provides name information associated with the calling party to the called party"*. In the year 2012, European Telecommunication Standards Institute (ETSI) released

⁹ <https://www.itu.int/rec/T-REC-Q.731.3-199303-S/en>

the technical specification No TS 122 096 V11.0.0 (2012-10). Through the said specification, ETSI defined Calling Name Presentation (CNAP) supplementary service as *"[t]he CNAP supplementary service enables the called party to receive the calling name information of the calling party."*

- 2.20 Today, for identification of the calling party, the modern telecommunication systems can make available both 'telephone number', and 'name' of the calling party. Put together, telephone number and name can adequately identify a calling party. For this reason, in many countries such as the United States of America (USA), Canada, United Arab Emirates (UAE), for the purpose of identifying the calling party, the 'name' of the calling party is also made available to the called party at the time of an incoming call.
- 2.21 In India, in the year 2022, Telecom Engineering Center (TEC), Department of Telecommunications (DoT) released the standard 25898:2022¹⁰ titled 'General on Supplementary Services'. Through this document, TEC defined *"a recommended set of supplementary services to the Teleservices and Bearer services which will be supported by a PLMN in connection with other networks as a basis for the definition of the network capabilities required"* which included CNAP supplementary service. In essence, in India, the CNAP supplementary service has been recommended by TEC to be supported by public land mobile networks.
- 2.22 In order to curb the menace of fraudulent calls, vishing and spam calls, it is indeed necessary that a calling party should be identified with the help of two attributes viz. telephone number and calling name (CNAM). This requirement may be met in case calling name presentation (CNAP) service is introduced in the Indian telecommunication network. The Authority is of the view that introduction of CNAP supplementary service in the Indian telecommunication networks will prove to be beneficial to telephone subscribers for the following reasons:

¹⁰ <https://tec.gov.in/pdf/3gpp/25898%202022.pdf>

- (a) Any called party will be able to identify the calling party, and thereby, make an informed decision for picking the incoming call. Such identification will help in curbing unsolicited commercial calls, obscene calls, and fraudulent calls.
- (b) The outgoing calls of any genuine calling party, whether an individual or a business, will more likely be answered.
- (c) Overall, CNAP supplementary service will help in reducing the mental agony and economic loss of telephone subscribers.

2.23 For the implementation of CNAP supplementary service, the originating access service provider will have to provide the telephone number as well as name of the calling party at the call set up stage. The Authority notes that Unified License¹¹ Agreement mandates the provision of calling line identification (CLI) at network level, where CLI is defined as the *"identity of the calling/ originating customer in terms of the telephone number assigned as per E.164 of ITU Recommendation/ IP Address or any other identification as may be prescribed by the Licensor from time to time."*

2.24 The Authority notes that the ambit of calling line identification (CLI) in case of telephone call is only the telephone number assigned as per ITU Recommendation E.164¹². For this reason, the originating access service provider provides only the telephone number of the calling party in the call set up stage. The Authority is of the view that for the introduction of calling name presentation (CNAP) supplementary service, the definition of calling line identification (CLI) requires to be expanded to include calling name (CNAM).

2.25 On the aspect of the need for obtaining consent from telephone consumers, the Authority is of the view that in case a choice is given to telephone subscribers to withhold their name identity when they make outgoing telephone calls, it would

¹¹ The para 39.21(i) of Chapter VI of the Unified License (Security Conditions) mandates as below:
"39.21 (i) Calling Line Identification (CLI) shall be provided. ..."

¹² <https://www.itu.int/rec/T-REC-E.164-201011-I/en>

result in a situation where unscrupulous elements and telemarketers will choose to withhold their name identity for malicious intentions. In such a situation, telephone consumers would continue to be the victim of scams, vishing and spam perpetuated by unscrupulous elements and unregistered telemarketers. This will defeat the purpose of introduction of CNAP supplementary service in Indian telecommunication network.

2.26 The Authority also notes that there is an existing procedure for subscribers desirous of withholding their identity through Caller Line Identification Restriction (CLIR), established by DoT in their guidelines on Caller Line Identification Restriction (CLIR) on 03.02.2015. These guidelines outline the procedure to be followed for availing CLIR, by three categories of subscribers: (a) normal subscribers, (b) officers of Central Intelligence Agencies and (c) dignitaries. The Authority is of the view that after the introduction of CNAP supplementary service, in case a telephone subscriber, who has availed CLIR facility, makes an outgoing telephone call, the terminating access service provider should also disable the CNAP of such a subscriber to the called party.

2.27 In light of the above, **the Authority recommends that-**

- (a) Calling Name Presentation (CNAP) Supplementary Service should be introduced in Indian telecommunication network.**
- (b) All access service providers should provide Calling Name Presentation (CNAP) supplementary service to their telephone subscribers upon their request.**
- (c) The calling name (CNAM) of each telephone subscriber should be provided by the originating access service providers.**
- (d) The definition of Calling Line Identification (CLI) given in the Annexure-I of Unified License should be amended as below:
"CALLING LINE IDENTIFICATION (CLI) means identity of the calling/originating subscriber in terms of the telephone number assigned as per E.164 of ITU Recommendation/ IP Address and the**

Calling name (CNAM) or any other identification as may be prescribed by the Licensor from time to time.”

- (e) CNAM of the telephone subscribers, who have availed the calling line identification restriction (CLIR) facility, should not be presented to the called party.**

B. Name source to be used for displaying calling name (CNAM)

2.28 The following question was raised in the CP dated 29.11.2022 regarding the source to be used for displaying calling name (CNAM):

Q4. Should the name identity information provided by telephone consumers in the Customer Acquisition Forms (CAFs) be used for the purpose of CNAP? If your answer is in the negative, please elaborate your response with reasons.

Comments of stakeholders on the Q4

2.29 In response to the Q4, while most stakeholders have opined that the name identity information provided by telephone subscribers in the customer application forms (CAFs) should be used for the purpose of CNAP, some other stakeholders have expressed concerns on the use of name information provided by telephone subscribers in the CAFs for the purpose of CNAP.

2.30 A broad summary of the comments received from stakeholders supporting the name information provided by telephone subscribers in the CAFs to be used for the purpose of CNAP is given below:

- (a) The name identity provided in CAF is verified against Government recognized identity proofs, therefore, it should be deemed most authentic and should be used for CNAP.
- (b) The CAF based name identity information is also readily available and is regularly updated as per the DoT's instructions.

- (c) A single point collection and diligent verification of data through the CAFs would eliminate all the errors of data acquisition and processing. A dispersed mode of collection and verification of data later in the process would lead to higher costs and higher probability of errors and frauds.

2.31 On the other hand, some stakeholders have expressed certain concerns on the use of CAF as given below:

- (a) The know your customer (KYC) process undertaken by telecommunication service providers is not watertight. Instances of fraudulent KYC or cases where consumers manage to forge identity documents to obtain mobile connections have been seen. Unless the existing KYC process is strengthened and re-verification of suspected connections is done, the entire purpose of CNAP supplementary service may be defeated.
- (b) Using the CAF name may also present a unique challenge for persons who have changed their legal names, or do not use it in social interactions especially persons from marginalized communities and/ or persons who, due to their matrimonial or personal reasons, choose not to reveal their last names.

Analysis w.r.t. the Q4

2.32 The Authority examined the comments of stakeholders and is of the view that the name identity information provided by telephone subscribers in the CAFs, which is verified through Government recognized identity proofs, is, at present, the most reliable and verifiable name information available with access service providers for the purpose of CNAP. Besides, DoT, in the recent past, has taken several measures for strengthening the subscribers' verification process. Nonetheless, to reap the benefits of CNAP facility in an effective and efficient manner, there is a need to have a robust KYC mechanism in place whereby a subscriber can be uniquely identified. The Section 3(7) of the Indian Telecommunication Act, 2023 provides as below in this regard:

"Any authorised entity which provides such telecommunication services as may be notified by the Central Government, shall identify the person to whom it provides telecommunication services through use of any verifiable biometric based identification as may be prescribed."

Implementation of such a mechanism will help in a long way to have effective benefits of CNAP facility.

- 2.33 The Authority notes that the legal name for some telephone subscribers might have changed from the time of submission of the CAF. The Authority notes that, through the instructions on verification of new mobile subscribers (pre-paid & postpaid) dated 09.08.2012¹³, DoT has laid down a framework for change in the name of subscriber through the following provision:

"The change of name of subscriber is not permitted as the SIM card in user terminal is not transferable. The change in name between the blood relatives/ legal heirs is permitted provided new CAF and all the procedure as for registering a new subscriber is followed and new SIM Card is issued. However, after the change in name the connection shall be treated as new connection. In such cases, change in address is not permitted. Further, No Objection Certificate from the original user shall also be taken. In case of death of the original user, death certificate will suffice instead of No Objection Certificate."

- 2.34 The Authority is of the view that in the case of telephone subscribers, whose legal names have changed from the time of submission of the CAF, a suitable mechanism should be established for amending the name information of the telephone subscriber provided by it through the CAF, based on the request of the telephone subscriber, provided that such a request is supported by the verifiable identity documents issued by the Government. The Authority is also of the view that DoT

¹³Source:

<https://sancharsaathi.gov.in/SancharSaathiDocuments/ImportantDocuments/DoT%20instructions%20on%20Verification%20of%20New%20Mobile%20Subscribers%20-%20dated%202009-08-2012.pdf>

should formulate suitable guidelines for access service providers for this purpose, duly considering any possible misuse of the feature by unscrupulous persons.

2.35 In view of the above **the Authority recommends that-**

(a) The name identity information provided by telephone subscribers in the Customer Application Form (CAF) should be used for the purpose of CNAP.

(b) For the telephone subscribers, whose legal name have got changed since the time of submission of the CAF, a suitable mechanism should be established by access service providers, to amend the name information of telephone subscribers, based on the explicit request of telephone subscribers provided that such a request is supported by verifiable identity documents issued by the Government. In this regard, DoT should issue necessary guidelines to access service providers, duly considering any possible misuse of this feature by unscrupulous persons.

C. Technical model for implementing CNAP supplementary service in Indian telecommunication network

2.36 DoT, while providing the background note on CNAP supplementary service, through its letter dated 11.07.2022, had indicated that CNAP supplementary service should be technology neutral and internet independent. After analyzing the international experience and the available information, the Authority, through the CP dated 29.11.2022, proposed four models for implementing CNAP supplementary service in the telecommunication networks in India. The models proposed by the Authority in the CP dated 29.11.2022 are described below.

(1) Model No. 1: Each TSP establishes and operates a CNAP database in respect of its subscribers

2.37 In this model, each TSP establishes and operates a CNAP database in respect of its own subscribers. At the time of call set up, the originating TSP does a CNAP lookup in its own CNAP database using the telephone number of the calling subscriber and extracts the CNAP data corresponding to it. The originating TSP then sends this CNAP data over the signaling path to the terminating TSP. Intermediate network nodes pass along the CNAP data. The terminating TSP receives the CNAP data and does a CNAP presentation to the called party. The following figure provides an outline of this model.

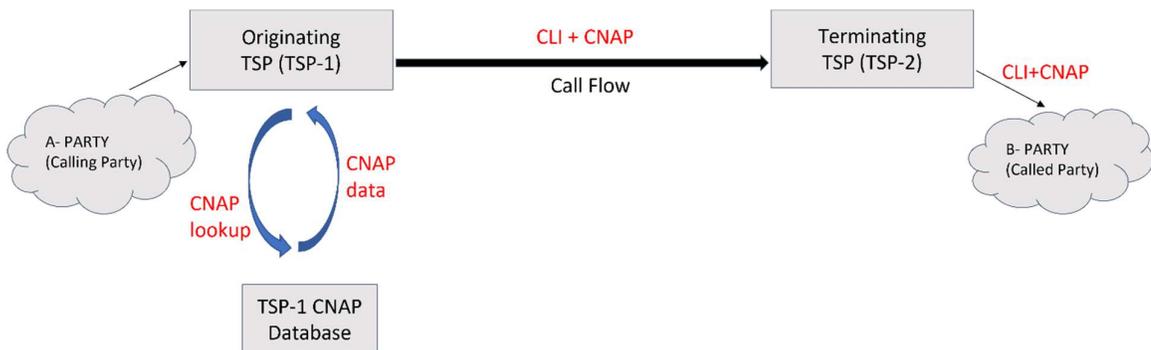


Figure-1: Outline of Model No. 1

2.38 For the implementation of Model No. 1, each TSP will have to establish a CNAP database in respect of its own subscribers. Besides, intermediate network nodes might need to be upgraded to cater to the passage of CNAP data on the signaling path over the telecommunication network.

(2) Model No. 2: The terminating TSP seeks CNAP data from the originating TSP

2.39 In this model, each TSP establishes and operates a CNAP database in respect of its own subscribers. This model comprises of the following steps:

- (a) Based on the telephone number of the calling party, the terminating TSP dips in its own Mobile Number Portability (MNP) database to determine the originating TSP.
- (b) In the next step, in case the terminating TSP and the originating TSP are the same, the terminating TSP does a CNAP lookup in its own CNAP database, retrieves the CNAP data and does a CNAP presentation to the called party. However, in case the originating TSP is different from the terminating TSP, the terminating TSP does a CNAP lookup in the originating TSP's CNAP database, retrieves the CNAP data and does a CNAP presentation to the called party.

2.40 The following figure provides an outline of this model.

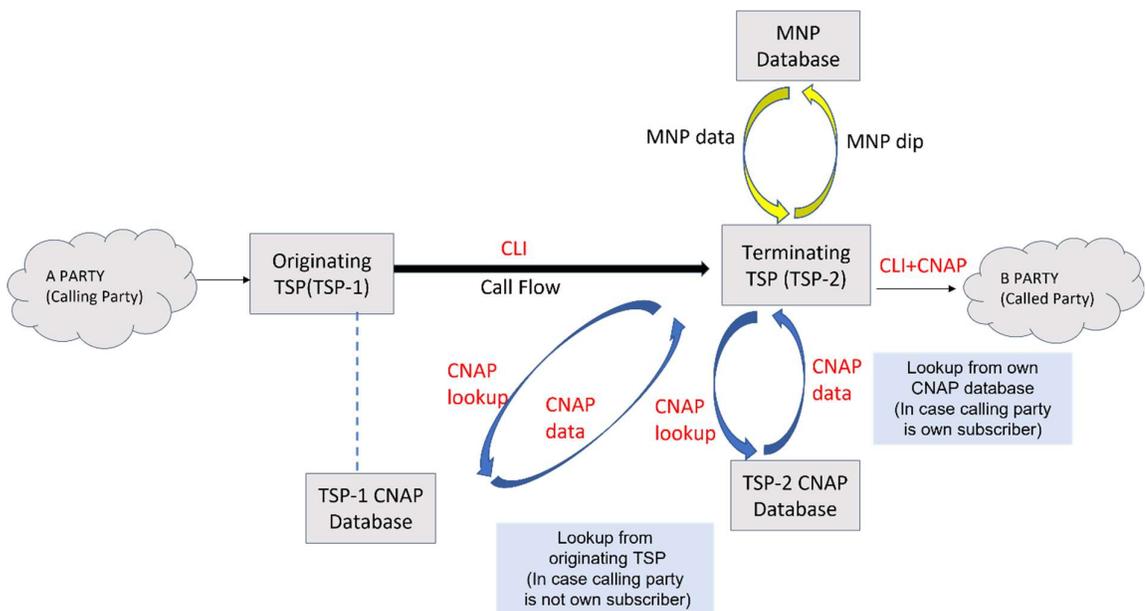


Figure 2: Outline of Model No. 2

2.41 For implementation of Model No. 2, each TSP will need to establish a CNAP database in respect of its own subscribers. Additionally, each TSP will need to provide access to its CNAP database, to other TSPs.

(3) Model No. 3: A third party establishes and operates a centralized CNAP database

2.42 In this model, a third party establishes and operates a centralized CNAP database. Whenever a new subscriber is acquired by any TSP, telephone number and the corresponding name identity of the newly added subscriber is inserted in the centralized CNAP database. At the time of call set up, the originating TSP sends the telephone number of the calling party to the terminating TSP over the signaling path. The terminating TSP then does a CNAP lookup in the centralized CNAP database using the telephone number. The terminating TSP retrieves the CNAP data of the calling party and does a CNAP presentation to the called party. The following figure provides an outline of this model.

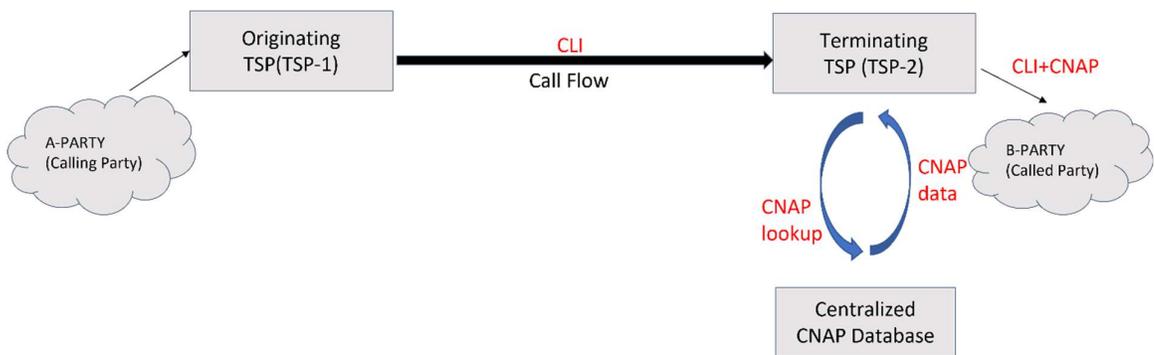


Figure 3: Outline of Model No. 3

2.43 For implementation of the Model No. 3, a centralized CNAP database will be established and operated by a third party. Individual TSPs will send timely updates to the centralized CNAP database upon acquisition of new subscribers or deactivation of the existing subscribers.

- (4) Model No. 4: Each TSP maintains a CNAP database to keep a copy of the centralized database established and operated by a third party

2.44 This model, in a sense, is a combination of Model No.2 and Model No.3. In this model, two types of CNAP databases are to be established viz. (a) a centralized CNAP database established and operated by a third party, and (b) CNAP databases established by each TSP, which contain a replica of the centralized CNAP database. The contents of CNAP databases established by individual TSPs are synchronized with the centralized CNAP database and are updated daily.

2.45 In this model, at the time of call set up, the originating TSP sends the telephone number of the calling party to the terminating TSP over the signaling path. The terminating TSP then does a CNAP lookup in its own CNAP database, retrieves the CNAP data of the calling party and does a CNAP presentation to the called party. The following figure provides an outline of this model.

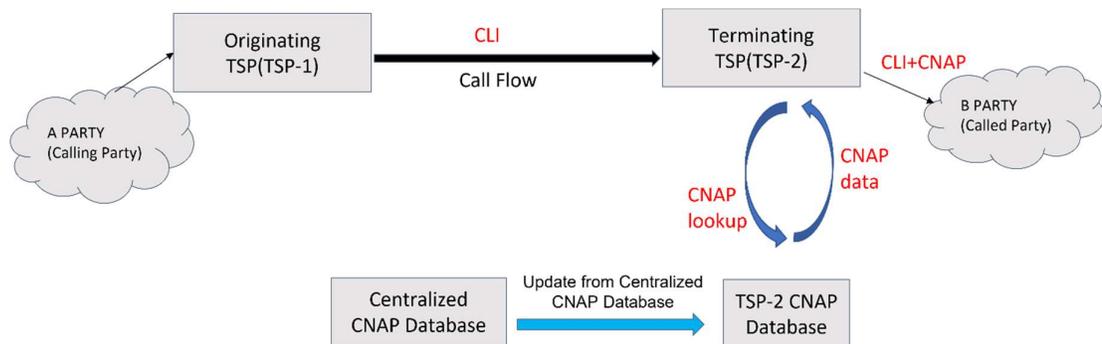


Figure 4: Outline of Model No.4

2.46 In this background, the Authority raised the following question in the CP dated 29.11.2022:

Q5. Which among the following models should be used for implementation of CNAP in telecommunication networks in India?

- (a) Model No. 1, in which a CNAP database is established and operated by each TSP in respect of its customers and the name information is sent by the originating TSP to the terminating TSP during the process of call set up; or*
- (b) Model No. 2, in which a CNAP database is established and operated by each TSP in respect of its own customers. The terminating TSP queries into its MNP database to determine the originating TSP of the calling party and then performs a CNAP lookup on the CNAP database of the originating TSP; or*
- (c) Model No. 3, in which a centralized CNAP database is established and operated by a third party with an update mechanism from each TSP in respect to their customers; the terminating TSP performs CNAP lookup from the centralized CNAP database at the time of receiving a call; or*
- (d) Model No. 4, in which a centralized CNAP database is established and operated by a third party, and individual CNAP databases are established by all Telecom service providers; the Telecom service providers keep a copy of the centralized database and perform local CNAP lookup at the time of receiving a call; or*
- (e) Any other suitable model for implementation of CNAP along with a detailed description of the model.*

Comments of stakeholders on the Q5

- 2.47 On the question of preferred model for implementation of CNAP in Indian telecommunication networks, stakeholders have provided divergent views. While most stakeholders leaned towards one or the other model proposed by the Authority, a few other stakeholders suggested new models for implementation of CNAP.
- 2.48 A summary of the views, expressed by the stakeholders who have supported Model No.1, is given below:

- (a) Model No.1, in which each access service provider keeps its own subscriber database, is the right model. However, implementation of this model will pose certain challenges such as-
 - (i) Legacy circuit switched (CS) based core network will need to be upgraded or replaced.
 - (ii) Intermediate network nodes will need to be upgraded to cater to the passage of CNAM data on the signaling path over the telecommunication network.
 - (iii) End-to-end interconnectivity path from calling to called customer will need to be based on internet protocol (IP) - requiring interconnection to be all IP in case of inter-operator calls.
- (b) Model No. 1, in which each TSP maintains CNAM database of its own subscribers and sends the CNAM data to the terminating service provider at the time of call set up, is preferable. This is on the assumption that there should not be any major concerns in interconnection with respect to the flow of CNAM. This may, therefore, require assessment of technical feasibility, call set up time change and costs to be considered by the Authority.
- (c) A centralized CNAM database creates risks to consumer data at large. For this reason, Model No. 1 (or Model No. 2) is preferable since in this model, each TSP maintains federated databases instead of the creation of a centralized CNAM database.

2.49 The views expressed by the stakeholders who have supported Model No.2 are summarized below:

- (a) Model No. 2 should be preferred where each TSP maintains a CNAM database of its own subscribers and provides read-only access to other authorized TSPs on demand.
- (b) A centralized CNAM database creates risks to consumer data at large. For this reason, Model No. 2 (or Model No. 1) is preferable since in this model, each TSP maintains federated databases instead of the creation of a centralized CNAM database.

- (c) Model No. 2, in which a CNAM database is established and operated by each TSP in respect of its own subscribers, should be considered with slight modification. The CNAM database should be established and operated on permissioned blockchain (distributed ledger technology) by each TSP in respect of its own subscribers.
- 2.50 The stakeholders who have supported Model No.3 have opined that this model provides the best possible operating conditions despite its disadvantages like coordination issues with multiple players, additional investment, and attendant higher cost of operation.
- 2.51 The views expressed by the stakeholders who have supported Model No.4 may be summarized as below:
- (a) Model No. 4 is preferable because it will not have any additional load on signaling link and will result in a miniscule increase in call set up time.
 - (b) Model No. 4 is the most viable option because it allows each terminating TSP to control its own quality of service on CNAP. Each TSP will need only one connection to the centralized CNAP database to provide updates when a subscriber changes his or her connection.
- 2.52 On the other hand, a few stakeholders opined that none of the models suggested by TRAI are preferable. The views of such stakeholders are summarized below:
- (a) A Common Mobile App (CMA) of individual access service providers, like the third-party apps available in the market should be used for providing caller name information to consumers.
 - (b) For providing calling party name information to the called party, the terminating telecom service provider should send an SMS with the calling party name to the called party.
 - (c) None of the models proposed by TRAI in the consultation paper can address the technical requirements to implement CNAP at the network level. The Model

No. 1 could have been the best suited model if all interconnections between networks in the country were IP-based, which is not the case at present.

2.53 With a view to ascertain as to whether the telecommunication networks in India will be able to support the provision of CNAP supplementary service, the Authority, through the CP dated 29.11.2022, solicited comments of stakeholders on the following question:

Q7. Do the existing telecommunication networks (both wireless and wireline) in India support the provision of CNAP supplementary service? If no, what changes/ additions will be required to enable all telecommunication networks in India with CNAP supplementary service?

Comments of stakeholders on the Q7

2.54 In response to the Q7, stakeholders have stated that the latest technologies like IP Multimedia Subsystem (IMS) and voice over LTE (VoLTE) support CNAP fully; however legacy nodes in 2G and 3G network will not support CNAP; besides, the legacy nodes in wireline networks will not support CNAP. A few stakeholders have also averred that it is not possible to indicate the changes required to existing telecommunication networks to support the provision of CNAP supplementary service.

2.55 A summary of the views expressed by stakeholders in response to the Q7 is given below:

(a) Circuit switched (CS) networks are not equipped for handling CNAP transit as this functionality is not available in the CS network nodes. On the other hand, Session Initiation Protocol (SIP) header supports CNAP supplementary service for calls within the IMS network. The CNAP facility is available in switches of all new generation networks (NGN), and only a patch will need to be developed to extend CNAP facility.

- (b) The legacy nodes in 2G and 3G network will not support CNAP, as CNAP was neither part of requirements in request for comments (RFC) to vendors, nor it was part of the general requirements (GR) of Telecom Engineering Center (TEC). Also, CNAP will not be passed on the time division multiplexing (TDM) based interconnections between networks and a change in existing call flow will be needed.
- (c) A significant development is required for the implementation of CNAP as the existing legacy mobile telecom networks will need to be replaced with new technology elements. Even if CNAP is supported in some 2G/ 3G nodes, it has not been tested and may bring up performance issues as many of the legacy nodes are in End of Life (EoL) or End of Support (EoS) category where the original equipment manufacturer (OEM) has stopped development for these nodes.

Analysis w.r.t. the Q5 and Q7

- 2.56 Considering the stakeholder's comments, the technical models proposed by the Authority may be classified in two groups:
- (a) 1st group comprising of Model No. 1: Here, the CNAM data will flow in the call setup message from the originating network to the terminating network.
 - (b) 2nd group comprising of Model No. 2, Model No. 3, and Model No. 4: Here, the terminating access service provider will query an external CNAM database before presenting the calling name information to the called party.
- 2.57 For implementing CNAP through the Model No. 1, it must be ensured that the CNAM data can seamlessly flow in the call setup message from the originating network to the terminating network. For this purpose, the core network nodes, which take part in call flow, should be capable of the passage of CNAM information through them in a manner similar to calling line identification (CLI). Specifically, the following network elements should be capable of the passage of CNAM information in the call setup message:

- (a) Core network nodes of access service providers and national long distance operators (NLDOs), which take part in voice call flow;
- (b) Points of interconnection (POIs) between access service providers, and POIs between access service providers and NLDOs.

2.58 Prior to examining the above, a brief outline of the present topology of telecommunication networks in the country is given below.

2.59 A typical telecommunication network comprises of mainly two parts viz. access network, and core network. Access network refers to that part of the network which connects end-user devices (such as telephones) to the core network. Core network refers to the central part of the telecommunication network that manages the traffic between different access networks and routes data to the appropriate destination. The core network is typically composed of several interconnected network elements, such as switches, routers, gateways, and servers.

2.60 The following schematic diagram depicts the flow of voice telephony calls on telecommunication networks in inter-circle call scenario:

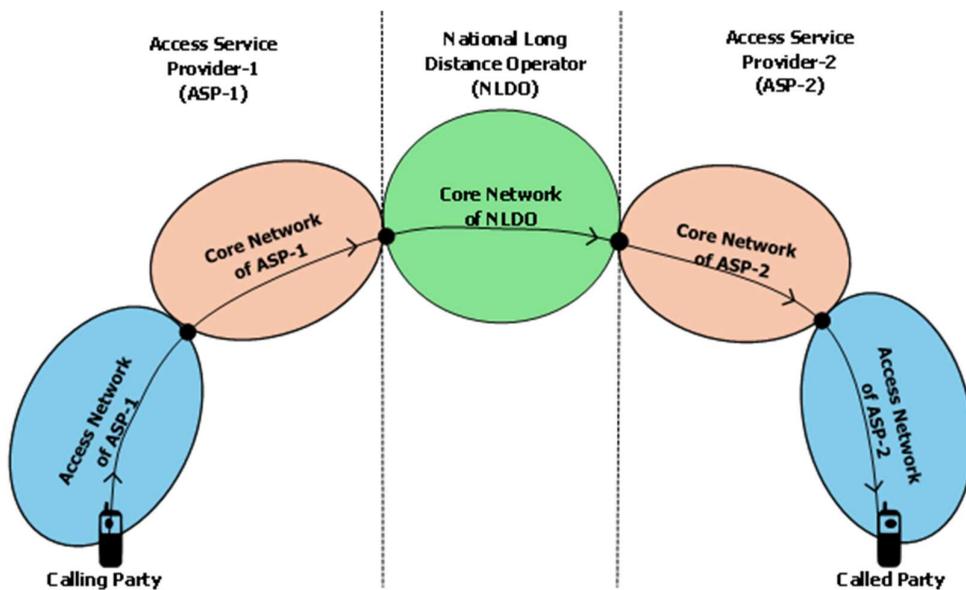


Figure 5: Schematic Diagram for voice call flow in telecommunication networks

- 2.61 The technologies and protocols used in the access network, as well as core network have evolved with the passage of time to cater to the newer applications and use cases. Earlier, voice telephony was the flagship telecommunication service. For carrying voice telephony traffic across the telecommunication networks, circuit switching¹⁴ was preferred. Therefore, for a long time, most of the telecom service providers across the world deployed circuit switched networks. However, of late, data communication is progressively gaining prominence. This has led to a shift towards IP packet-switched¹⁵ telecommunication networks.
- 2.62 At present, for carrying voice telephony traffic, mainly two types of core networks are being used in Indian telecommunication network viz.
- (a) circuit switched (CS) core using circuit switching technology; and
 - (b) IP Multimedia Subsystem (IMS) core using IP packet switched technology.

CS core network and IMS core network

- 2.63 In the past decade, the wireless access networks have progressively moved from being voice centric (2G/ 3G) to becoming data focussed (4G/ 5G). In 2G/ 3G era, world-over, the telecom service providers established circuit switched (CS) voice core networks. Before the introduction of 4G in wireless access networks, IMS core, which is based on IP packet switching, had already been developed. However, during the evolution from 2G/ 3G networks to 4G networks, most of the telecom service providers did not abandon their CS core networks. Of late, telecom service providers have started replacing the CS core nodes with IMS core nodes. Today, most of the telecom service providers in India, which have 2G/ 3G as well as 4G/ 5G in their wireless access networks, operate both the CS core network, as well as the IMS core network.

¹⁴ Circuit switching involves a dedicated path between the source (calling party) and the destination (called party).

¹⁵ In packet switching, the data is transferred by means of addressed packets so that a channel is occupied during the transmission of the packet only, and upon completion of the transmission, the channel is made available for the transfer of other traffic.

2.64 Telephone calls are set up in CS core networks using the legacy signalling system, known as Common Channel Signalling No. 7 (CCS No. 7) system. During the consultation process, telecom service providers have reported that, at present, their CS core nodes are not equipped for passage of CNAM information in the call setup message. For enabling the passage of CNAM information through the CS core nodes in the call setup message, telecom service providers will have to customize the CS core nodes with the support of original equipment manufacturers (OEMs). Telecom service providers have also contended that many of their CS core nodes are at the stage of End-of-Life (EoL)¹⁶, or End-of Service Life (EoSL)¹⁷, meaning thereby, OEMs' support for customizing such CS core nodes for the passage of CNAM information in the call setup message may not be available; therefore, such nodes would require to be replaced for supporting the passage of CNAM information in the network. Besides, unlike the IMS core, there is no provision of storing the name information of telephone subscribers within the CS core. Therefore, any telecom service provider, which has deployed CS core network, will require to establish a separate CNAM database of its telephone subscribers and connect the CNAM database with the CS core node for fetching the calling name information before inserting it in the call setup message.

2.65 On the other hand, telephone calls in IMS core networks are set up using a signalling system known as Session Initiation Protocol (SIP), which supports IP packet switching. The IMS core networks deployed by telecom service providers can readily support the passage of CNAM information through them. Besides, within the IMS core, there is a provision for storing the name information of the telephone

¹⁶ End-of-Life (EOL) is a term the OEM uses to indicate a piece of equipment has reached the end of its "useful life" and will no longer market, sell or update equipment after a specified date. This is most often due to a newer model being released by the manufacturer that replaces the older model.

Source: [https://theremigroup.com/eol-vs-eosl/#:~:text=End%2Dof%2DLife%20\(EOL\)%20is%20a%20term%20the,that%20replaces%20the%20older%20model.](https://theremigroup.com/eol-vs-eosl/#:~:text=End%2Dof%2DLife%20(EOL)%20is%20a%20term%20the,that%20replaces%20the%20older%20model.)

¹⁷ End of Service Life (EoSL) (or End of Support Life) meaning: Phrases OEMs use to indicate the ending of services and updates for server, storage and network equipment. At this point, the OEM no longer sells, provides updates, or renews hardware support contracts on these systems.

Source: <https://serviceexpress.com/resources/eol-eosl-tip-sheet/#eosl>

subscribers. Therefore, any telecom service provider, which has deployed exclusively an IMS core network, will not require to establish a separate CNAM database of its telephone subscribers.

- 2.66 In short, while CNAP supplementary service may readily be implemented in IMS core networks through Model No. 1, the CS core networks will require the following intervention for implementing CNAP through Model No. 1:
- (a) The CS core nodes, which take part in voice call flow, will require customization to support the passage of CNAM information through them.
 - (b) The CS core nodes, which are at the stage of end of life (EoL) or end of service life (EoSL), will require to be replaced with the nodes which can support the passage of CNAM information.
 - (c) A CNAM database would require to be established for storing the name information of telephone subscribers attached to the CS core. This database would be required to be connected to the CS core for fetching the calling name information, before inserting it in the call setup message.

Points of Interconnection

- 2.67 With respect to network interconnection, the clause 27.3 of Chapter-IV (Technical Conditions) of Unified License mandates as below:
- "27.3 Interconnection between the networks of different Licensees for carrying circuit switched traffic shall be as per national standards of CCS No.7 and for carrying IP based traffic as per Telecom Engineering Centre (TEC) standards as amended from time to time by Telecom Engineering Centre (TEC) ..."*
- 2.68 For carrying IP based traffic, TEC through the Standard No. TEC/SD/IT/IPI-001/01 NOV-2015¹⁸ titled 'IP Based Interconnection Between Service Providers Networks' has mandated that *"[t]he interconnect interface shall support basic SIP, ISUP*

¹⁸ Source: <https://tec.gov.in/pdf/IRs/TEC-SD-IT-IPI-001-01-NOV-15.pdf>

enabled SIP (SIP-I) and SIGTRAN protocols for signaling and data transfer. BICC-CS2 can also be used instead of SIP-I.”

2.69 As the CCS No. 7 signalling system is used in the circuit switched networks, which makes use of time division multiplexing (TDM¹⁹) technique, the nodes which work on CCS No. 7 signalling system are also referred to as TDM nodes. For this reason, the points on interconnection (POIs) between two networks may be one of the following types:

- (a) TDM-TDM interconnection;
- (b) IP-TDM interconnection; and
- (c) IP-IP interconnection.

2.70 Any telecom service provider, which has all-IP interconnections with other telecom service providers, can readily implement CNAP at POIs through Model No. 1. However, the telecom service providers, which have TDM-based interconnections with other telecom service providers, will require customization of POIs for implementing CNAP through Model No.1.

2.71 While in the present state of telecommunication networks in India, there are certain concerns, as outlined above, in the implementation of CNAP supplementary service through Model No. 1, the Authority is cognizant that Model No. 1 is, in general, the most suitable model for implementation of CNAP supplementary service for the following reasons:

- (a) Model No. 1 does not require a telecom service provider to share the CNAM database of its subscribers with other telecom service providers. This model also does not require establishment and operation of a centralized database by a third party. The sharing of the name information database of one's

¹⁹ Time division multiplexing (TDM) is a data, voice and video communications technique that interleaves several low-speed signals into one high-speed transmission channel.
Source: [https://www.gartner.com/en/information-technology/glossary/tdm-time-division-multiplexing#:~:text=Time%20division%20multiplexing%20\(TDM\)%20is,one%20high%20speed%20transmission%20channel](https://www.gartner.com/en/information-technology/glossary/tdm-time-division-multiplexing#:~:text=Time%20division%20multiplexing%20(TDM)%20is,one%20high%20speed%20transmission%20channel).

subscribers with other telecom service providers, as well as establishment of a centralized name information database might give rise to concerns related to privacy and possible misuse of subscriber's personal information.

- (b) Amongst all the models proposed by the Authority in the CP dated 29.11.2022, Model No. 1 will result in the least increase in call set up time for the following reasons:
- (i) Under Model No. 1, there would be only one database query in case of CS core network and none in case of IMS core network.
 - (ii) Under model No. 1, an originating service provider in a licensed service area (LSA) will query the CNAM database of its own telephone subscribers in the LSA, which will be a rather small database. On the other hand, under Model No. 3 and Model No. 4, each terminating service provider will query a CNAM database of all telephone subscribers of all telecom service providers in the country. As a result, the query response time is likely to be significantly lower in case of Model No. 1.

2.72 Notwithstanding the fact that Model No. 1 is, in general, the most suitable model for implementation of CNAP supplementary service, the Authority is of the view that in the present state of telecommunication networks in the country, implementation of Model No. 1 may result in a significant modification in the core network and corresponding expenditure and time for implementation on the part of telecom service providers on customization and replacement of legacy network elements.

2.73 With the above observations, the Authority proceeds to examine the strengths and weaknesses of the models in the 2nd group mentioned in the para 2.56 above.

2.74 In the technical models in group 2 (viz. Model No. 2, Model No. 3, and Model No. 4), the terminating access service provider will query an external CNAM database before presenting the calling name information to the called party. The strength of these models is that telecom service providers will not have to customize or replace

their CS core nodes and TDM-based POIs for passage of CNAM information in call setup message.

2.75 In terms of the method of querying the external CNAM database, the three models in the group 2 differ from each other as outlined below:

- (a) In Model No. 2, the terminating TSP dips in its own Local Number Portability Database (LNPD) to determine the originating TSP based on the telephone number of the calling party. In case the terminating TSP and the originating TSP are the same, the terminating TSP does a CNAM lookup in its own CNAM database, retrieves the CNAM data and does a CNAM presentation to the called party. However, in case the originating TSP is different from the terminating TSP, the terminating TSP does a CNAM lookup in the originating TSP's CNAM database, retrieves the CNAM data and does a CNAM presentation to the called party.
- (b) In Model No. 3, a third party establishes and operates a centralized CNAM database. Whenever a new subscriber is acquired by any TSP, telephone number and the corresponding name information of the newly added subscriber is inserted in the centralized CNAM database. The terminating TSP does a CNAM lookup in the centralized CNAM database using the telephone number of the calling party. The terminating TSP retrieves the CNAM data of the calling party and does a CNAM presentation to the called party.
- (c) In Model No. 4, two types of CNAM databases are to be established viz. (i) a centralized CNAM database established and operated by a third party, and (ii) CNAM databases established by each TSP, which contain a replica of the centralized CNAM database. At the time of receiving a call, the terminating TSP does a CNAM lookup in the replica CNAM database held by it using the telephone number of the calling party, retrieves the CNAM data of the calling party and does a CNAM presentation to the called party.

2.76 Besides the fact that telecom service providers will not need to customize or replace their CS core nodes and TDM-based POIs for passage of CNAM information in call

setup message for implementing CNAP using the models in the 2nd group, there are specific strengths and weaknesses of these models as outlined below:

| Model | Strength | Weakness |
|--------------------|---|---|
| Model No. 2 | <ul style="list-style-type: none"> - No requirement to establish, maintain and secure an external CNAM database or to establish local copies of external CNAM database. - No concerns related to privacy and possible misuse of subscriber's personal information - No concerns related to competition | <p>Call setup time may increase as the terminating TSP will have to make two database queries as against only one query in Model No. 3 and 4.</p> |
| Model No. 3 | <p>TSPs will require to interface with only the centralized CNAM database.</p> | <ul style="list-style-type: none"> - Establishment of a centralized name information database might give rise to concerns related to privacy and possible misuse of subscriber's personal information (subscriber's name juxtaposed with telephone number). - Significant investment may be required for establishment, maintenance and securing of the external centralized CNAM database of all telephone subscribers in the country. - As the centralized database will have to handle a very large |

| Model | Strength | Weakness |
|--------------------|---|--|
| | | number of queries, its query response time may be relatively higher. As a result, the call setup time may increase. |
| Model No. 4 | Call setup time will increase only marginally on account of a dip in the local CNAM database. | <ul style="list-style-type: none"> - Establishment of a centralized name information database and local copies of CNAM database might give rise to concerns related to privacy and possible misuse of subscriber's personal information (subscriber's name juxtaposed with telephone number). - As the name information of all subscribers of other TSPs will be available to each TSP in the local copies of centralized CNAM database, it may give rise to concerns related to competition. - Significant investment may be required for establishment, maintenance and securing of the external centralized CNAM database and local copies of CNAM database of all telephone subscribers in the country. |

2.77 Keeping in view the significant concerns related to safety and security of subscriber's personal information, as well as the concerns of the competition in the

Model No. 3 and 4, the Authority is of the view that Model No. 2 is the most suitable amongst the models in the 2nd group.

2.78 The Authority also examined the alternative models suggested by a few stakeholders as below:

- (a) A stakeholder has suggested the use of a Common Mobile App (CMA), like third party apps available in the market, for provisioning CNAP. The Authority notes that DoT has indicated the need for an internet independent CNAP supplementary service. As the proposed CMA will require internet connectivity for its functioning, the Authority is of the view that CMA will not meet the requirement for an internet independent CNAP supplementary service.
- (b) Another stakeholder has suggested that the terminating service provider should send an SMS containing the calling party's name to the called party after it receives the call. The Authority notes that short message service (SMS) is a store and forward service which is not real-time. The SMS sent by the terminating service provider may take significant time to reach the called party. By then the ringing phase of incoming call might have elapsed. Accordingly, the Authority is of the view that an SMS based solution may not serve the intended purpose of enabling the called party to decide as to whether it should pick the incoming call or not.

2.79 Considering the stakeholders' comments and the above analysis, the Authority is of the view that Model No.1 is, in general, the best model for implementing CNAP supplementary service. However, because a substantial portion of the core network of telecom service providers in India continues to be CS core network, the CNAP supplementary service should, at present, be implemented using Model No. 2. At a later stage, as and when the CS core networks are phased out from the Indian telecommunication networks, the CNAP supplementary service should be implemented using Model No. 1.

Analysis of the comments on CLI spoofing

2.80 The Authority also examined the comments of a stakeholder that Model No. 2 to 4 will give rise to cases of fraud and spam due to CLI spoofing from international locations. In this regard, the Authority takes note of the efforts of DoT towards addressing the issue of CLI spoofing. On 06.07.2022, DoT issued an amendment to Unified License to address the issue of CLI spoofing. Through this order, DoT amended para 6.5 of the Chapter-XI (International Long Distance Service Authorization) of Unified License as below:

"6.5 All International Long Distance Operators (ILDOS) should drop all calls with no CLI or improper CLI at their Gateways and should ensure that all calls handed over by ILDOs to National Long Distance Operators (NLDOs)/ Access Service Providers, should bear "Nature of Address Indicator (NAI)" field in case of CCS7/equivalent field in SIP/ IP as "International Number". For identifying an improper CLI, ITU-T recommendations on E.164 numbering scheme may be referred."

2.81 The Authority also recognizes the efforts underway to address the issue of CLI spoofing from the mobile numbers of international out-roamers. International out-roamers are Indian telephone subscriber, who are roaming on the network of a service provider in a foreign country. The Authority takes note of the fact that DoT is in the process of conceptualizing the creation of a centralized database for out-roamers. It is likely that once such a mechanism is implemented, all international long distance operators (ILDOS) will query the centralized database to ascertain as to whether a particular Indian telephone subscriber, from whose CLI an incoming call is received at the international gateway, is indeed on international roaming. In case it is ascertained that the Indian telephone subscriber, whose CLI is received at the international gateway is not on international roaming, the ILDO will drop such an incoming call at the international gateway. The Authority is of the view that such a mechanism, as and when instituted, would address the concern of CLI spoofing

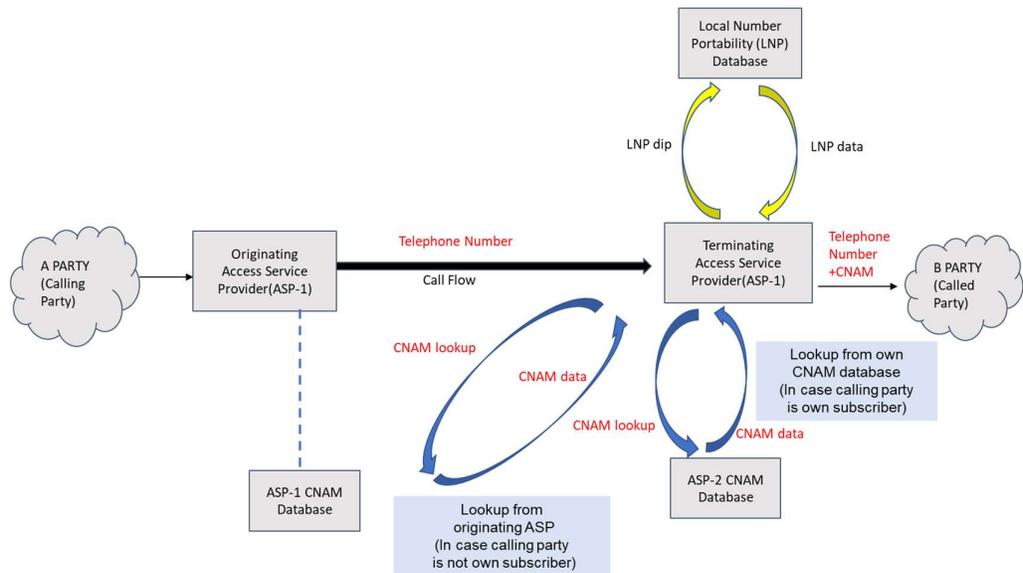
from international locations, and thereby the concern of false CNAP, in the case of Model No. 2.

2.82 In view of the above, **the Authority recommends that-**

(a) As a large part of the Indian telecommunication network is still based on circuit-switched (CS) core, CNAP supplementary service should be implemented in the Indian telecommunication network using a technical model as outlined below:

- (i) Each access service provider establishes and operates a database containing subscriber's name against the telephone number of its subscribers.**
- (ii) At the time of receiving a telephone call, based on the telephone number of the calling party, the terminating access service provider queries its Local Number Portability Database (LNPD) to determine the originating access service provider of the telephone call.**
- (iii) In case the terminating access service provider and the originating access service provider of the telephone call are the same, the terminating access service provider queries its own calling name (CNAM) database, retrieves the CNAM information, and presents the CNAM to the called party.**
- (iv) However, in case the originating access service provider of the telephone call is different from the terminating access service provider, the terminating access service provider queries the CNAM database of the originating access service provider, retrieves the CNAM information, and presents the CNAM to the called party.**

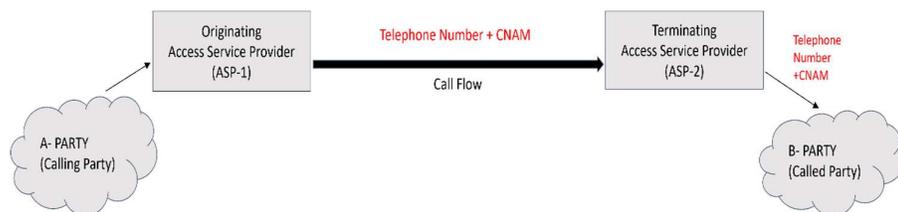
The following figure depicts a schematic diagram of the model outlined above.



(b) At a later stage, as and when the CS core networks are phased out from Indian telecommunication networks, the CNAP supplementary service should be implemented using a technical model as outlined below:

- (i) The originating access service provider sends the CNAM data over the signaling path to the terminating access service provider.**
- (ii) Intermediate networks transmit the CNAM data as received.**
- (iii) The terminating access service provider receives the CNAM data and presents CNAM to the called party.**

The following figure depicts a schematic diagram of the model outlined above.



D. Measures to ensure delivery of CNAP without increase in call set up time

2.83 Through the Consultation Paper dated 29.11.2022, stakeholders' comments were invited on the following questions:

Q6. What measures should be taken to ensure delivery of CNAP to the called party without a considerable increase in the call set up time?

Comments of stakeholders on the Q6

2.84 In response to the Q6, most of the stakeholders have opined that call setup time will increase upon the implementation of CNAP, while a few others have contended that the increase in call setup time will not be significant. A few stakeholders have also suggested measures so that CNAP may be implemented without a considerable increase in the call setup time.

2.85 A summary of the viewpoints of the stakeholders, who have suggested that it is not possible to ensure delivery of CNAP to the called party without a considerable increase in the call set up time, is given below:

- (a) Under the current circumstances, a considerable increase in the call set up time is inevitable. If all telephone subscribers need to be configured with CNAP, it will add more loading on IT infrastructure and network platforms.
- (b) The increase in call setup time may cause concerns related to quality of service (QoS). TRAI will need to relax the QoS benchmark for call setup success rate (CSSR) if CNAP is implemented.

2.86 A summary of comments of the stakeholders who have suggested that it is possible to ensure delivery of CNAP to the called party without a considerable increase in the call set up time is given below:

- (a) Use of modern databases and access to CNAM data over IP network will not introduce significant latency.

- (b) In well optimized networks, the call setup time can be very close to the required timings.
- (c) The CNAP implementation in USA and Canda have increased the call latency only by 20 to 40 milliseconds.

2.87 One of the stakeholders suggested that telecom service providers should use a timeout mechanism; if the telecom service provider is unable to fetch the CNAM data due to any technical issues, the call should be progressed without CNAP.

Analysis w.r.t. the Q6

2.88 The Authority notes that while a few stakeholders have averred that call latency will not increase substantially, a few other stakeholders have opined that the implementation of CNAP service will result in a significant increase in call setup time, which may affect consumer experience. The Authority is of the view that it would be worthwhile to conduct a trial and assessment of CNAP supplementary service using the technical model recommended above in one licensed service area (LSA) with subscriber base of each telecom service provider in the LSA. Based on the learnings of the trial and assessment exercise, the CNAP supplementary service should be implemented on pan-India basis.

2.89 In view of the above, **the Authority recommends that prior to the implementation of CNAP supplementary service on pan-India basis in Indian telecommunication network, a trial and assessment of the implementation of CNAP supplementary service should be conducted in one licensed service area (LSA) with subscriber base of each telecom service provider in the LSA.**

E. Handset related issues

2.90 DoT, while providing the background note on CNAP, had requested the Authority to explore the feasibility of implementation of CNAP without the need for Internet or smartphone/ devices. In this regard, the Authority notes that telephone consumers (both mobile and landline) make use of a variety of phones of different makes and models. While some mobile handsets could already be supporting CNAP feature, others might require software upgrades to enable CNAP feature on them. Some landline telephone sets in use have the alphanumeric display feature while many others do not. In this regard, the Authority, through the CP dated 29.11.2022, sought the comments of the stakeholders on the following question:

Q8. Whether the mobile handsets and landline telephone sets in use in India are enabled with CNAP feature? If no, what actions are required to be taken for enabling CNAP feature on all mobile handsets and landline telephone sets?

Comments of stakeholders on the Q8

2.91 In response to the above question, a couple of stakeholders have opined that the current handsets are already capable of handling CNAP because calling numbers are displayed on all current handsets-feature phones and smartphones, landline handsets with display as well as landline telephones using fiber to the home (FTTH) technology.

2.92 On the other hand, many stakeholders opined that most of mobile handsets and landline telephone sets in use in India are not enabled with CNAP feature. A summary of their viewpoints is given below:

(a) Only 4G phones and VoLTE supported devices rolled out after the 1st quarter of 2021 have CNAP feature as a part of their standard functionality. The availability of CNAP feature in a device may depend on several factors like manufacturing date, display capability and software-based controls etc. The

existing PSTN telephone sets do not have the capability to support 15-digits alpha-numeric CNAP.

- (b) Enabling CNAP on the smartphone handsets which have crossed software update cycle (2-3 years) committed by the handset manufacturer would be a challenge.
- (c) This feature may not be available in the landline telephone sets in use in the country. In most cases, new landline telephone sets may be required to be purchased by customers or provided by telecom service providers for display of CNAM.

2.93 A few other inputs given by stakeholders in response to the Q8 are given below:

- (a) The Telecommunications and Digital Government Regulatory Authority (TDRA) of United Arab Emirate (UAE) has announced a new Calling Name Presentation feature that is now a requirement for all mobile phones sold in UAE, both new and existing products on the market. Phones already approved and operating in UAE need to meet the new requirement. Registered dealers are required to update the software to ensure the devices are complying.
- (b) Issues related to mobile handsets not supporting CNAP feature may be taken care of by mobile handset manufacturers by Ministry of Electronics and Information Technology (MEITY) for enabling the CNAP features in their future supplies.

Analysis w.r.t. the Q8

2.94 The Authority takes note that the TDRA, UAE has implemented the Calling Name Presentation feature in UAE networks. The TDRA's Technical Specification on 'Calling Name Presentation' dated 26.05.2021 includes a section on mobile devices, which mandates as below:

"All mobile phones shall implement and comply with the following behaviors:

- 1- Mobile handset shall be configured to receive and display the calling name from the network.*

- 2- Mobile handset shall present the calling name and the calling number in the full screen mode.*
- 3- Mobile handset shall display the calling name with or without the calling number in the banner.*
- 4- Handset shall support the capability to reply and call back the received call with the name presented.*
- 5- Mobile handset shall display the calling name and the calling number in the history of the call log.*
- 6- Calling name presentation feature shall be enabled for GSM, UMTS, LTE, VoLTE and 5G and any new technology.”*

2.95 The Authority notes that the issue of the device ecosystem supporting the CNAP facility has got multiple facets as listed below:

- (a) The type of device, i.e., smartphone, feature phone and landline handset.
- (b) The technology supported by the device like:
 - (i) PSTN, ISDN or FTTX in the case of wireline.
 - (ii) 2G,3G, 4G,5G, VoLTE, VoNR etc. in the case of wireless.
- (c) The manufacturing date, display capability and software-based controls of the device etc.
- (d) Whether the software update cycle (2-3 years) committed by the handset manufacturer has been crossed.
- (e) Operating System (OS) of the device in the case of smartphones.

2.96 The Authority recognizes that the device ecosystem is non-homogenised at present. Therefore, it would be difficult to enable the CNAP feature across all telephone devices. The Authority is of the view that the CNAP feature should be enabled on telephone devices on a 'best fit' basis. However, prospectively, the Government should issue appropriate instructions for making CNAP feature available in all devices sold in India.

2.97 Considering the comments of stakeholders and its analysis, **the Authority recommends that after acceptance of these recommendations, the Government should issue appropriate instructions for making CNAP feature available in all devices sold in India after a suitable cut-off date, say after six months from the date of notification.**

F. CNAP supplementary service for toll-free numbers

2.98 Through the CP dated 29.11.2022, stakeholders' comments were invited on the following questions:

Q9. Whether outgoing calls should be permitted from National Toll-Free numbers? Please elaborate your response.

Q10. In case the response to the Q9 is in the affirmative, whether CNAP supplementary service should be activated for National Toll-Free numbers? If yes, please provide a mechanism for its implementation.

Comments of stakeholders on the Q9 & Q10

2.99 In response to the above question, a few stakeholders have opined that outgoing calls should be permitted from National Toll-Free numbers (NTFN) as it will give consumers a better experience for NTFN in context of reliability of incoming calls from these numbers.

2.100 However, most stakeholders have contended that outgoing calls should not be permitted from NTFN. In support of their contention, they have provided the following reasons:

(a) Internationally, the facility of outgoing calls has not been implemented for toll-free numbers.

(b) The routing architecture for NTFN is based on Intelligent Network (IN). Calls to NTFN are routed after querying into IN whereas other fixed line calls are taken through MSCs and GMSCs. Length of NTFN varies from 8 digits to 13 digits and

if we prefix country code '91' to it, then it may vary from 10 to 15 digits. Currently, the number length in our networks is fixed as 12 digits. If we prefix country code '91' to NTFN then, in case of callback/missed call scenario, calls will get routed towards Panipat SDCA (180 is STD code of Panipat, a district in Haryana). If we do not prefix 91 then, it will clash with the country code of the USA. Further, NTFN have always been inbound and hence, the billing architecture has always been built upon to bill the call receiving party and not the originating caller party. Allowing outgoing calls from NTFN would require a base-level change in the billing architecture, which will be complicated and costly to implement.

- (c) Subscribers are already aware of the various toll-free numbers and thus providing CNAP feature on the toll-free numbers would be of limited benefit to the consumers.

Analysis w.r.t. the Q9 and Q10

2.101 The Authority recognizes that the proposal for permitting outgoing calls from NTFNs is being evaluated in the context of enabling businesses to call their customers for transactional and service-related matters from NTFNs. In this regard, it is worthwhile to mention that based on the TRAI's proposal, DoT, on 03.04.2023, has decided to allocate a separate numbering series level '141 xxx', exclusively for service and transactional voice calls. Thus, the requirement of enabling businesses to call their customers for transactional and service-related matters will be met through the new numbering series '141 xxx'.

2.102 In view of the above, the Authority is of the view that, at present, there is no requirement of permitting outgoing calls from National Toll Free Numbers. Therefore, the issue of activating CNAP supplementary service in respect of National Toll-Free Numbers does not arise.

G. CNAP supplementary service for registered telemarketers

2.103 The TCCCPR, 2018 identifies a telemarketer as 'a person or legal entity engaged in the activity of transmission or delivery of commercial communication or scrubbing or aggregation'. Registered telemarketers, on behalf of the principal entities, make commercial calls to telephone customers through 140-level series number. In this background, comments of the stakeholders were sought on the following questions:

Q11. Whether CNAP supplementary service should be implemented for 140-level numbers allocated to registered telemarketers?

Q12. If your answer to Q11 is in the affirmative, then kindly elucidate the technical considerations for implementing CNAP supplementary service for registered telemarketers so that the name identity of the principal entity may be presented to the called party.

Comments of stakeholders on the Q11 and Q12

2.104 In response to the above question, a few stakeholders have opposed the implementation of CNAP on 140-level numbers. In support of their contention, they have stated that CNAP should not be implemented for registered telemarketers' numbers as most of the customers are already aware of the fact that 140xxx level is a telemarketing call.

2.105 On the other hand, many stakeholders have supported implementation of CNAP on 140-level numbers. The views of such stakeholders are summarized below:

- (a) Inclusion of CNAP for 140 level numbers will ensure display of accurate information of the enterprise, thereby, reducing chances of frauds.
- (b) Under the Telecom Commercial Communication Customer Preference Regulation (TCCCPR), 2018, registered telemarketers are responsible for reaching out to consumers on behalf of principal entities. Therefore, consumers have the right to be informed about the identity of the Telemarketer who is making the call.

- (c) CNAP supplementary service should be implemented on 140 level series because telemarketers are the major originators of unwanted calls. Consumers can then decide whether to attend or not attend to these calls or even block them individually.

2.106 On the issue of implementing CNAP supplementary service for registered telemarketers so that the name of the principal entity (PE) may be presented to the called party, the stakeholders have provided the following views:

- (a) In case it is decided to enable CNAP for 140 series, the Authority can leverage the DLT based solution under the TCCCPR, 2018. The telemarketer with 140 series can register the name to be displayed against the SIP link, which can be implemented post TSP validation. However, the biggest challenge will be to educate the consumers on these display names, as otherwise it can lead to a massive increase in complaints.
- (b) Allowing the CNAP for these numbers may require adding extra fields to the database for its principal entity, telemarketer etc.

Analysis w.r.t. the Q11 and Q12

2.107 The Authority notes that 140 level numbers are, at present, allocated for promotional calls by registered telemarketers. Display of the name of the registered telemarketer in case of a call originated from the numbering series 140xxx will help the called party to decide as to whether it should pick the incoming calls.

2.108 As DoT has already decided to allocate a separate numbering series '141xxx' exclusively for service and transactional voice calls under TCCCPR, 2018, the Authority is of the view that calling party name should be presented invariably in case of calls originated from 141 level numbers.

2.109 In view of the above, **the Authority recommends that in case of telephone calls originating from 140 level numbers allocated to registered**

telemarketers, and any other number series allocated for making transactional or service related calls, the name information of the subscriber entity should, invariably, be presented to the called party.

H. Presentation of 'preferred name' in case of bulk connections and business connections

2.110 Through the CP dated 29.11.2022, the Authority sought the comments of the stakeholder on the following questions:

Q13. Whether the bulk customers and National Toll-free numbers can be given a service of presenting their 'preferred name' in place of the name appearing in the CAF? Please elaborate your response.

Q14. In case the response to the Q13 is in the affirmative, what rules should govern the implementation of such a service?

2.111 As already mentioned in the preceding sections, a bulk mobile connection means "10 or more than 10 mobile connections issued in a single name to individuals or a company or an organization or at any given address by all the Licensed service providers in the service area".²⁰ Further, DoT, through the order dated 31.08.2023²¹, has discontinued the process of issuing connections under the bulk category and introduced a new category of 'business connections' instead.

Comments of stakeholders w.r.t. the Q13 and Q14

2.112 In response to the above questions, while many stakeholders have suggested that bulk connections should be given a facility of presenting their 'preferred name' in place of the name appearing in the CAF, a few others have contended against it.

²⁰Source:

<https://sancharsaathi.gov.in/SancharSaathiDocuments/ImportantDocuments/DoT%20instructions%20on%20Verification%20of%20New%20Mobile%20Subscribers%20-%20dated%2009-08-2012.pdf>

²¹ Source: <https://dot.gov.in/sites/default/files/KYC.pdf?download=1>

2.113 The stakeholders, who have supported the facility of 'preferred name' to bulk customers and NTFN have suggested that CNAP supplementary service should be provided as a Value-Added Service (VAS) with additional features wherein customers are allowed to use their preferred name, commercial name, a public institution or non-governmental organization's name, trademark; however, a verifiable documentary proof in support of the 'preferred name' should be provided by the customer before the preferred name is assigned to it.

2.114 The stakeholders who have contended against the facility of 'preferred name' to bulk customers and NTFN have given the following arguments in support of their contention:

- (a) It will be difficult to identify a *bonafide* 'preferred name' as there would not be any mechanism to check the authenticity. Telecom service providers would have to rely on the declaration provided by the business connection, which may be misleading and give rise to the risk of spam/ frauds.
- (b) There should not be any facility to display preferred name, as businesses may keep a 'preferred name' like some other entity, thereby, duping the called party.

Analysis w.r.t. the Q13 and Q14

2.115 The Authority recognizes that a facility similar to the proposed 'preferred name' has been implemented in Turkey, where the service providers are allowed to use the sender's name, commercial name, a public institution or a non-governmental organization's name, trademarks, and patents as CLI, provided that the respective customers possess official documents to prove their legitimate right to use these names.

2.116 The Authority notes that granting a facility of 'preferred name' to bulk connections and business connections will be helpful for businesses as the preferred name will provide a better 'name recall' to the called party. The Authority recognizes that

there are certain unique identifiers for enterprises registered with the Government such as the 'trademark name' registered with the Ministry of Corporate Affairs or the 'trade name' registered with GST council. The Authority is of the view that subscriber entities holding bulk connections and business connections may be permitted to select any one of these officially registered identifiers as a 'preferred name' in place of its CAF name, provided that the subscriber entity is able to present the necessary documents to prove its legitimate use of this name.

2.117 With respect to the matter related to the use of 'preferred name' by NTFNs, it is noteworthy that on the Q9 (Whether outgoing calls should be permitted from NTFNs?), The Authority has already concluded that there is no requirement of activating CNAP supplementary service in respect of National Toll-Free Numbers at present. Therefore, the requirement of the use of 'preferred name' in respect of NTFNs does not arise.

2.118 In view of the above, **the Authority recommends that-**

- (a) The subscriber entities holding bulk connections and business connections should be given the facility of presenting their 'preferred name' in place of the name appearing in the CAF.**
- (b) The 'preferred name' could be the 'trademark name' registered with the Ministry of Corporate Affairs, or the 'trade name' registered with the GST Council, or any other such unique name duly registered with the Government, provided that the subscriber entity is able to present the necessary documents to prove the ownership of such name.**
- (c) DoT should formulate guidelines for documents to be provided by subscriber entities holding bulk connections and business connections for registering their 'preferred name' with the access service providers. DoT should also stipulate necessary guidelines for preventing any misuse of this facility.**

I. Regulatory provisions in the telecommunication service licenses

2.119 Through the CP dated 29.11.2022, the Authority sought the comments of stakeholders on the following question:

Q15. Whether there is a requirement of any amendment in telecommunication service licenses/ authorizations in case CNAP is introduced in the Indian telecommunication network? Please provide a detailed response.

Comments of stakeholders on the Q15

2.120 In response to the above question, a few stakeholders have contended that there is no requirement of any amendment in telecommunication service licenses/ authorizations in case CNAP supplementary service is introduced in the Indian telecommunication network. On the other hand, a few others have suggested that telecommunication service licenses/ authorizations should be amended to enable introduction of CNAP in the telecommunication networks.

Analysis w.r.t. the Q15

2.121 For implementation of CNAP supplementary service in the Indian telecommunication network, the Authority, in para 2.27 above, has already recommended enhancement of the scope of CLI in respect of telephone calls. The Authority is of the view that there is a need to define new terms viz. 'Calling Name Presentation (CNAP)' and Calling Name (CNAM) in the Annexure-I (Definition of terms and expressions) of the Unified License.

2.122 Accordingly, **the Authority recommends that-**

(a) a new term 'Calling Name (CNAM)' should be included in the Annexure-I of the Unified License as below:

"CALLING NAME (CNAM) means the name identity of the calling/ originating subscriber as per the Customer Application Form (CAF)

or any other identification as may be prescribed by the Licensor from time to time.”

(b) a new term ‘Calling Name Presentation (CNAP)’ should be included in the Annexure-I of the Unified License as below:

“CALLING NAME PRESENTATION (CNAP) means presentation of the CNAM to the called party by the terminating service provider.”

2.123 Further, the Authority is of the view that DoT should issue comprehensive guidelines to telecom service providers for implementation of CNAP supplementary service in the Indian telecommunication networks. In this regard, a provision should be made in the relevant telecommunication service licenses to the effect that the licensees will ensure provision of CNAP supplementary service as per the guidelines issued by the Licensor from time to time.

2.124 Considering the stakeholders’ comments and its further analysis, **the Authority recommends that the following provision should be included in the relevant telecommunication service licenses:**

“The Licensee will ensure that calling name presentation (CNAP) supplementary service is provided as per the guidelines issued by the Licensor from time to time.”

2.125 The following chapter lists the summary of recommendations.

CHAPTER – III: SUMMARY OF RECOMMENDATIONS

3.1 The Authority recommends that-

- (a) **Calling Name Presentation (CNAP) Supplementary Service should be introduced in Indian telecommunication network.**
- (b) **All access service providers should provide Calling Name Presentation (CNAP) supplementary service to their telephone subscribers upon their request.**
- (c) **The calling name (CNAM) of each telephone subscriber should be provided by the originating access service providers.**
- (d) **The definition of Calling Line Identification (CLI) given in the Annexure-I of Unified License should be amended as below:
"CALLING LINE IDENTIFICATION (CLI) means identity of the calling/originating subscriber in terms of the telephone number assigned as per E.164 of ITU Recommendation/ IP Address and the Calling name (CNAM) or any other identification as may be prescribed by the Licensor from time to time."**
- (e) **CNAM of the telephone subscribers, who have availed the calling line identification restriction (CLIR) facility, should not be presented to the called party.**

(Para 2.27)

3.2 The Authority recommends that-

- (a) **The name identity information provided by telephone subscribers in the Customer Application Form (CAF) should be used for the purpose of CNAP.**
- (b) **For the telephone subscribers, whose legal name have got changed since the time of submission of the CAF, a suitable mechanism should be established by access service providers, to amend the**

name information of telephone subscribers, based on the explicit request of telephone subscribers provided that such a request is supported by verifiable identity documents issued by the Government. In this regard, DoT should issue necessary guidelines to access service providers, duly considering any possible misuse of this feature by unscrupulous persons.

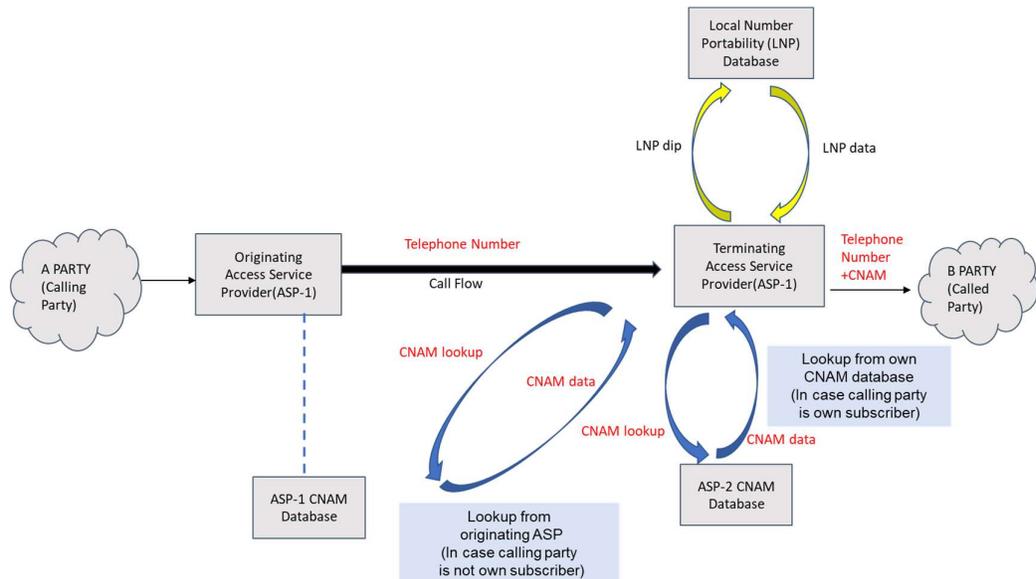
(Para No. 2.35)

3.3 The Authority recommends that-

- (a) As a large part of the Indian telecommunication network is still based on circuit-switched (CS) core, CNAP supplementary service should be implemented in the Indian telecommunication network using a technical model as outlined below:**
 - (i) Each access service provider establishes and operates a database containing subscriber's name against the telephone number of its subscribers.**
 - (ii) At the time of receiving a telephone call, based on the telephone number of the calling party, the terminating access service provider queries its Local Number Portability Database (LNPB) to determine the originating access service provider of the telephone call.**
 - (iii) In case the terminating access service provider and the originating access service provider of the telephone call are the same, the terminating access service provider queries its own calling name (CNAM) database, retrieves the CNAM information, and presents the CNAM to the called party.**
 - (iv) However, in case the originating access service provider of the telephone call is different from the terminating access service provider, the terminating access service provider queries the CNAM database of the originating access service**

provider, retrieves the CNAM information, and presents the CNAM to the called party.

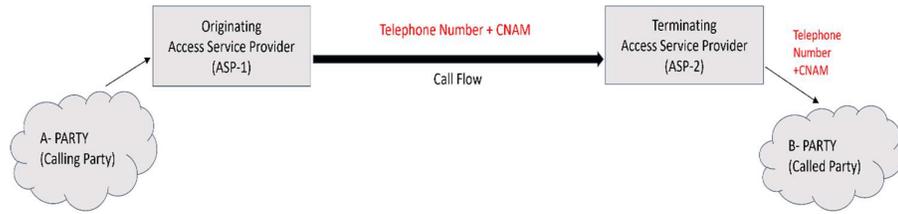
The following figure depicts a schematic diagram of the model outlined above.



(b) At a later stage, as and when the CS core networks are phased out from Indian telecommunication network, the CNAP supplementary service should be implemented using a technical model as outlined below:

- (i) The originating access service provider sends the CNAM data over the signaling path to the terminating access service provider.
- (ii) Intermediate networks transmit the CNAM data as received.
- (iii) The terminating access service provider receives the CNAM data and presents CNAM to the called party.

The following figure depicts a schematic diagram of the model outlined above.



(Para No. 2.82)

3.4 The Authority recommends that prior to the implementation of CNAP supplementary service on pan-India basis in Indian telecommunication network, a trial and assessment of the implementation of CNAP supplementary service should be conducted in one licensed service area (LSA) with subscriber base of each telecom service provider in the LSA.

(Para No. 2.89)

3.5 The Authority recommends that after acceptance of these recommendations, the Government should issue appropriate instructions for making CNAP feature available in all devices sold in India after a suitable cut-off date, say after six months from the date of notification.

(Para No. 2.97)

3.6 The Authority recommends that in case of telephone calls originating from 140 level numbers allocated to registered telemarketers, and any other number series allocated for making transactional or service related calls, the name information of the subscriber entity should, invariably, be presented to the called party.

(Para No. 2.109)

3.7 The Authority recommends that-

- (a) The subscriber entities holding bulk connections and business connections should be given the facility of presenting their 'preferred name' in place of the name appearing in the CAF.**

- (b) **The 'preferred name' could be the 'trademark name' registered with the Ministry of Corporate Affairs, or the 'trade name' registered with the GST Council, or any other such unique name duly registered with the Government, provided that the subscriber entity is able to present the necessary documents to prove the ownership of such name.**
- (c) **DoT should formulate guidelines for documents to be provided by subscriber entities holding bulk connections and business connections for registering their 'preferred name' with the access service providers. DoT should also stipulate necessary guidelines for preventing any misuse of this facility.**

(Para No. 2.118)

3.8 The Authority recommends that-

- (a) **a new term 'Calling Name (CNAM)' should be included in the Annexure-I of the Unified License as below:
"CALLING NAME (CNAM) means the name identity of the calling/ originating subscriber as per the Customer Application Form (CAF) or any other identification as may be prescribed by the Licensor from time to time."**
- (b) **a new term 'Calling Name Presentation (CNAP)' should be included in the Annexure-I of the Unified License as below:
"CALLING NAME PRESENTATION (CNAP) means presentation of the CNAM to the called party by the terminating service provider."**

(Para No. 2.122)

3.9 The Authority recommends that the following provision should be included in the relevant telecommunication service licenses:

“The Licensee will ensure that calling name presentation (CNAP) supplementary service is provided as per the guidelines issued by the Licensor from time to time.”

(Para No. 2.124)

DoT's reference dated 21.03.2022

**F. No. 20-405/2013- AS-I
Ministry of Communications
Department of Telecommunications
(Access Service Wing)
20, Ashoka Road, Sanchar Bhawan, New Delhi**

Dated the 21st March, 2022

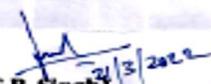
Subject: Provision of displaying Name of Subscriber to called party for incoming calls- seeking recommendations of TRAI

It has been desired to examine the feasibility of Calling Name Presentation (CNAP) in Indian Telecommunication Network. The CNAP is the supplementary service which enables the called party to receive the calling name information of the calling party. This supplementary service provides for the ability to indicate the name information of the calling party to the called party at call set-up time for all incoming calls.

2. Presently, in Indian Telecom Networks, only the mobile/landline numbers are being displayed as Calling Line Identification (CLI) during incoming calls. There is no mandate in the license for providing CNAP services.

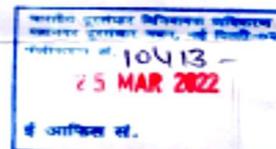
3. In Unified License, the Calling Line Identification is defined as:
CALLING LINE IDENTIFICATION (CLI) means identity of the calling/originating subscriber in terms of the telephone number assigned as per E.164 of ITU Recommendation/IP Address or any other identification as may be prescribed by the Licensor from time to time.

4. In view of above, TRAI is requested to submit its recommendations under Section 11 (1) (a) of TRAI Act, 1997 (as amended) on introducing the Calling Name Presentation (CNAP) facility in Indian Telecommunications Network.


(S.B. Singh)

**Deputy Director General (AS)
Phone: 23036918**

**To,
The Secretary
Telecom Regulatory Authority of India,
MahanagarDoorsanchar Bhawan,
Jawaharlal Nehru Marg (Old Minto Road)
New Delhi – 110002.**



LIST OF ACRONYMS

| S. No. | Acronym | Description |
|---------------|----------------|--|
| 1. | 3GPP | 3 rd Generation Partnership Project |
| 2. | A2P | Application to Person |
| 3. | BICC | Bearer Independent Call Control |
| 4. | CAF | Customer Acquisition Form |
| 5. | CLI | Calling Line Identification |
| 6. | CMA | Common Mobile App |
| 7. | CNAM | Caller Name |
| 8. | CNAP | Calling Name Presentation |
| 9. | CP | Consultation Paper |
| 10. | CS | Circuit Switched |
| 11. | CSSR | Call Set-up Success Rate |
| 12. | DLT | Distributed Ledger Technology |
| 13. | DoT | Department of Telecommunications |
| 14. | EoL | End of Life |
| 15. | EoS | End of Sale |
| 16. | FTTX | Fiber to the 'X' |
| 17. | GMSC | Gateway Mobile Switching Centres |

| S. No. | Acronym | Description |
|---------------|----------------|--|
| 18. | GST | Good & Service Tax |
| 19. | IMS | IP Multimedia Sub-system |
| 20. | IP | Internet Protocol |
| 21. | ISDN | Integrated Services Digital Network |
| 22. | ISUP | Integrated Services User Part |
| 23. | IT | Information Technology |
| 24. | ITU | International Telecommunication Union |
| 25. | IVRS | Interactive Voice Response System |
| 26. | LSA | Licensed Service Area |
| 27. | MeitY | Ministry of Electronics and Information Technology |
| 28. | MNP | Mobile Number Portability |
| 29. | MSC | Mobile Switching Centres |
| 30. | NGN | Next Generation Network |
| 31. | NTFN | National Toll-Free Numbers |
| 32. | OEM | Original Equipment Manufacturer |
| 33. | OHD | Open House Discussion |
| 34. | OTP | One Time Password |
| 35. | P2P | Person to Person |

| S. No. | Acronym | Description |
|---------------|----------------|---|
| 36. | PE | Principal Entities |
| 37. | PLMN | Public Land Mobile Network |
| 38. | PSTN | Public Switch Telephone Network |
| 39. | QoS | Quality of Service |
| 40. | RFC | Radio Frequency Centre |
| 41. | SIM | Subscriber Identity Module |
| 42. | SIGTRAN | Signal Transport |
| 43. | SIP | Session Initiated Protocol |
| 44. | SMS | Short Message Service |
| 45. | TCCCPR | The Telecom Commercial Communications Customer Preference Regulations, 2018 |
| 46. | TDM | Time Division Multiplexing |
| 47. | TDRA | Telecommunications and Digital Government Regulatory Authority, UAE |
| 48. | TM | Telemarketer |
| 49. | TRAI | Telecom Regulatory Authority of India |
| 50. | TSP | Telecommunication Service Provider |
| 51. | UCC | Unsolicited Commercial Communications |
| 52. | UL | Unified License |
| 53. | VAS | Value Added Service |

| S. No. | Acronym | Description |
|---------------|----------------|--------------------------------|
| 54. | VoLTE | Voice over Long-Term Evolution |
| 55. | VoNR | Voice over New Radio |