ONE CONSORTIUM

White Paper – “Cloud Numbers” telecom industry for Voice services

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One Consortium

FOREWORD

This paper describes how telephone numbers are used in a market where telephone numbers are no longer tied to a fixed line or physical device, but are increasingly hosted, routed, and managed in cloud-based environments. It urges regulators to apply numbering rules in a technologically neutral way that supports innovation, cross-border services, and new use cases such as contact centres and AI voice agents.

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Cloud numbers are telephone numbers that are hosted, controlled, and routed in IP infrastructure rather than being bound to specific device or physical connection or piece of on-premise equipment. To allow cloud-centric growth, innovation, productivity and societal benefits, regulators should treat cloud numbers within the electronic communications framework (e.g. EECC/ITU-style numbering regimes) but adapt implementation to reflect their virtual, dynamic and cross-border nature.

What is a Cloud Number?

As a starting point, it is somewhat unhelpful to single out and refer to telephone numbers used in a cloud setting as 'Cloud Numbers' (at times referred to as 'virtual numbers'[1] or 'hosted numbers'[2]) as they are not necessarily new (in use) and do not necessarily provide a different service to non-cloud, or traditional numbers-based services.

In both the traditional as well as the modern and evolved cloud sense, the telephone number provides the same functionality for end users and businesses: identifying calling parties. It is merely that in today's evolved technological marketplace, the same numbers are used to provide services via the internet in an all-IP environment and is not tied to a specific physical line or device.

Simplistically put: 'Numbers are numbers' and we urge NRAs not to be too swift in sub-dividing numbers types without careful consideration.

However, for the purposes of deriving a common understanding of Cloud numbers that supports growth and competitiveness in the marketplace, we submit the following: Cloud numbers are E.164 or similar telephone numbers that work over IP networks and are not tied to a physical access line, local exchange, or PBX port. Calls, and any other communications services that make use of numbers, are originated and terminated via VoIP or other IP technologies, and routing is managed in cloud platforms that can direct traffic to any compatible endpoint (fixed, mobile, soft-client, contact-centre, AI agent, etc.) over the internet or managed IP backbones. In past technologies, calls typically originated on copper access networks and switched using TDM technologies or similar.

[1] A virtual number is a regulated numbering resource issued by an authorised provider and used to deliver voice or messaging services through cloud-based routing rather than a fixed physical termination point.

[2] Hosted numbers are telephone numbers allocated under a national numbering plan that are managed by a communications provider on behalf of the number holder and delivered through a cloud or network-hosted platform, rather than directly from a locally installed line or switch.

Having acknowledged that the telephone number itself is not changing but the technologies using the telephone number is, we can now see that in many cases telephone numbers have in fact been used in a ‘cloud setting’ for several decades. For example, a business may have used the same telephone numbers for its traditional (physical) PBX service but has removed the PBX from its premises and transferred the functionality into the network; today, that would likely mean ‘into the cloud’ but the very same functionality existed before the term ‘cloud’ was coined. Therefore, NRAs or numbering administrators that, in today’s market place, seek to impose focused regulatory intervention on ‘cloud use’ of telephone numbers run the real risk of not only jeopardizing the development of the current and future communications market but may additionally jeopardize long term ‘pre-existing usage’ of cloud numbers.

Key functional characteristics of Cloud numbers include:

- Geographic, national, mobile, toll-free or other ranges that are reachable from the public telephone network using standard numbering plans.
- Detachment from a single physical location, with the ability to map the same number to users or devices in multiple locations, including remote work and global enterprise environments.
- Software-defined control (APIs, portals, automation) for allocation, routing, feature configuration, analytics and lifecycle management.
- Use in new digital use-cases such as on-demand work, home-working, global enterprise communications, sharing and gig platforms, ride-hailing, virtual contact centres and unified communications solutions as well as other ‘non voice communications’ services that make use of telephone numbers (such as call tracking etc).

Based on the above-described evolution of technology as well as the described commonality of phone number use and function shared between ‘traditional’ as well as ‘cloud’ numbers in terms of end-user experienced uses, but also a recognition of an dramatic expansion of new, innovative, uses: our view is that focus on any classification of numbers should be **technologically neutral** and be **based on the actual use of the numbers** (as experienced by end-customer making or receiving the communication in question).

As such, we are advising some caution when seeking to differentiate between telephone numbers as an inappropriate differentiation may result in undesired regulatory and commercial outcomes.

The global transition to all-IP means that telephone numbers will continue their convergence in the cloud and drive an expansion of uses. NRAs and Number Administrators are urged to consider de facto use of number as the source for any classification of number type as failing to do so may result in inefficient and undesired regulatory outcomes.

Why is it important to consider telephone numbers to be used in a Cloud setting?

In a market dependent of 'telephone numbers' (which are today fundamentally a regulatory construct) and which is undergoing dramatic changes at both the supply and demand level, it is crucial that the usage understanding of 'telephone numbers' in general and Cloud numbers specifically, is kept up to date. Failing to do so runs a real risk of stifling beneficial transition to modern technologies, constraining innovation, impeding growth and reduces end user values.

Understanding the Supply and Demand side evolution in the communications market is crucial in order to arrive at the correct regulatory framework for the regulator construct of telephone numbers that enable interoperability to function.

Supply and demand changes enabled by transition to all-IP and adoption of Cloud services

Demand-side trends

The migration from TDM to IP and cloud communications is increasing demand for flexible, virtualised numbering resources rather than traditional fixed assignments. Several structural drivers can be highlighted:

- End users as well as businesses have grown to expect and demand new features and functionality only possible to be realized over IP infrastructure but still reliant on telephone numbers for interoperability.
- Enterprise UCaaS/CCaaS: As PBX and contact-centre platforms move into the cloud, enterprises seek large pools of numbers that can be centrally managed, reassigned and scaled up or down per user, campaign or site, often across countries.

● Remote and hybrid work: Cloud numbers support users working from home, branch offices, or on the move, and create demand for “location-agnostic” services that still provide local presence and reachability for customers.

● Platform and gig-economy models: Marketplaces, ride-hailing, food delivery and other platforms increasingly use temporary or proxy numbers for privacy, safety and transaction tracking, which requires short-lived and high-volume allocations.

● In a world which is increasingly global and where cross border operations can be the technological default, Global cloud communications providers (Cross- border CPaaS and UCaaS players) build international inventories of cloud numbers to offer “local presence”. This is often done to ‘reach in’ to many jurisdictions via a single cloud platform, thus aggregating demand for ranges that may historically have been used only domestically.

The net effect is that demand is shifting from long-term and static/physical assignments (e.g. a fixed number to an end users home) to dynamic and location agnostic, high churn usage where a given inventory of numbers may serve many different end-users, applications and use-cases over time.

Supply-side transition to Cloud services

On the supply side, the transition to Cloud has important consequences for how numbering resources are planned, allocated and used:

● As the communications market is transitioning to the Cloud, ensuring telephone numbers are available is critical to enable the full realisation of value this transition can bring. Ensuring availability of Cloud numbers hence stimulates the development of the communications market and the values it brings, including, but not limited to: using bandwidth more efficiently, cheaper to build and operate services, and support a much wider range of services on a single converged infrastructure.

● Better utilisation of finite ranges: Because cloud numbers can be dynamically allocated and recycled, a single block can serve many sequential customers or applications, improving utilisation compared with legacy line-based allocation where numbers remained unused but not returned.

● Pressure on certain ranges: At the same time, specific, policy-favoured ranges (e.g. geographic numbers that convey local presence, mobile numbers used for authentication, or dedicated platform ranges) may experience supply pressure in popular locations if regulation still assumes one-time, long-term allocation per end-user.

● Opening access beyond traditional Electronic Communications Services/ Networks providers: Some regulators are considering or have implemented policies that allow numbering resources to be assigned to entities other than traditional electronic communications providers, subject to common criteria and safeguards.

Industry initiatives (e.g. petitions to modernise numbering and routing systems for the IP era) emphasise that legacy TDM-centric frameworks are creating inefficiencies, hindering innovation, and maintaining vulnerabilities in numbering and routing systems.

The transition towards Cloud is and will continue to drive:

● Supply side transition to more efficient and feature rich Cloud based services which on the Demand side stimulate a multitude of end user and corporate benefits as well as wider societal value creation.

● Mobility and Flexibility - Cloud numbers offer significant mobility—calls can be made and received from anywhere, ideal for remote work and business travel.

● Advanced Features – Cloud numbers typically provide advanced telephony features, such as, but not limited to, those use cases listed in this paper.

● AI Agents – Whilst trend in 2025 shows that person-to-person calling will not disappear it will increasingly be complemented and augmented by person-to-AI agent interactions from the Cloud. AI Agent platforms will need Cloud numbers.

● Scalability and Global Reach - Cloud numbers can be scaled up quickly as the functionality managing the numbers is software based and not associated with physical control; businesses can add numbers or users with a simple request, often accessing local or international numbers without physical infrastructure.

● Cost and Setup - Cloud numbers are generally more cost-effective, with lower initial investment and maintenance since no physical hardware is required and setup is fast.

As can be seen from the above stated, liberating the use of numbers from a traditional and physical network build into a 'cloud' manner enables innovative operators to exponentially expand on functionality. This change offers tremendous macro-economic opportunities and the delivery of values to society.

The changing market in numbers:

The global supply and demand changes, as well as opportunities, triggered by this world-spanning transiting to all-IP and cloud at this level are dramatic: Global PSTN call volumes are already in steep structural decline and, once major markets complete all-IP migration, residual PSTN minutes will fall to effectively zero within a few years. Existing evidence and traffic trends support an indicative postmigration decline rate of at least 10–15% per year globally, with faster shrinkage in advanced markets. As an example: In Japan, the incumbent reported that fixed line calls on the legacy network fell by 93% and total call duration by 97% between 2000 and 2015.[3]

However, the rapid drop of traditional call volumes does not mean that the call market itself is in decline. Rather, a growing share of voice moves to has moved to mobile, UCaaS, CPaaS and embedded application voice amongst many other new uses of communication. The use cases above describe some of them.

With new demand and opportunities driven by supply side investments, the overall 'voice communications' market sector is expected to grow significantly after the PSTN phaseout, but the growth will come less from "more minutes" and more from **higher value IP voice services, unified communications (UC), and AI enabled voice agents** layered on top of all-IP infrastructure.[3]

From a macro-economic perspective, the new, and nascent, communications industry is a multi billion dollar and rapidly growing sector which drives wide-reaching economic gains through cost efficiencies, enhanced productivity, innovation, and enabling next-generation digital services globally which, enable improved and augmented services to the end-users.

Changes to market participants, services demanded and provided to end-users and the value these changes, at a macro and societal level, means that NRAs should carefully explore how best to enable and incentivize early and wide adoption.

[3] Since the peak of fixed line communications in Japan (1997), non Fixed line services became the predominant voice communications service as early as 2000. In a recent SOUMO report, the continued drop of fixed line towards non Fixed and VoIP services increased by 15% per annum.

By way of example, the wider CPaaS market (Communications Platform as a Service (CPaaS), which by definition uses numbers in the cloud sense, and which is also dependant on cloud telephone numbers to 'connect' with communicating end users, is valued at approximately $22.89 billion to $32 billion in 2025. End-user preferences of services drive rapid market forecast growth with estimates suggesting the market could reach anywhere from around $86 billion to over $100 billion by 20304, representing a compound annual growth rate (CAGR) between 18% and 29%[4] depending on the analyst.

Moreover, the young global Voice AI Agents market is seeing rapid expansion, with most estimates placing its current value at a mere $2.4–$3.5 billion in 2024 but with forecasts of it reaching $21– $47.5 billion by 2030–2034, depending on the source and segment definition. This represents a compound annual growth rate (CAGR) between 30% and 37% for voice AI agents[5], reflecting their surge in adoption across industries such as customer service, healthcare, banking, and retail.5 Like CPaaS, Voice AI Agents need numbers to communicate with end users.

CPaaS and Voice AI Agents are two platforms within the broader digital transformation that is taking place at a global level. In a study commissioned by BT PLC (September 2025) in relation to effects of digital transformation in the United Kingdom, 'beneficiaries' of all-IP infrastructure rationalization include Health care (250M GBP), Utilities (2.1B GBP), Local government (480M GBP) and Emergency Services (140M GBP).[6]

Of course, societal values are crucial too and, arguably, we can here see the true impact of Cloud numbers:

● Cloud numbers have driven enormous opportunities for flexible working; not just being able to 'work from home' (which in its own right lowers barriers to employment and drives material green goals) but because cloud numbers are not tied to a physical line or location, they make it easier for remote workers, micro-entrepreneurs and people in under-served areas to participate in the digital economy.

[4] "Communication Platform as a Service (CPaaS) Market Size, Share and Trends Analysis 2026 to 2035" (insightaceanalytic 2026).

[5] C.f. "AI Voice Generators Market (2024 - 2030)" (grandviewresearch, 2026), "Voice AI Agents Market Size 2025-2029" (technavio, 2015) and 'AI voice in 2025: Mapping a $45 billion market shift" (agentvoice, 2025)

- Local virtual numbers in other countries make it cheaper and easier for families, migrants and diasporas to stay in touch, and for organisations (including NGOs) to offer reachable contact points across borders. ON a related note: Cloud numbers reduce the cost of domestic and especially international calling by using IP networks instead of traditional long-distance tariffs; they bring people closer together and can reduce loneliness and poor mental health.
- Cloud numbers offer protection in the form of Anonymization when the user so feels it is necessary: whether when booking a taxing or when making a life changing contact with health/support or other organisation where privacy has tended to be a barrier to seeking help.
- From a technical perspective, Cloud numbers enhance the protection of individual's data, fraud resilience, network security and can be re-routed during outages, disasters or local disruptions, helping maintain access to critical services and support lines.

However, the main societal values, we submit, are the ones yet to be launched and explored by end-users; we are merely at the cusp of the re-invention of the communications industry and at One Consortium we are eager to learn how the end-users decide to make value of it.

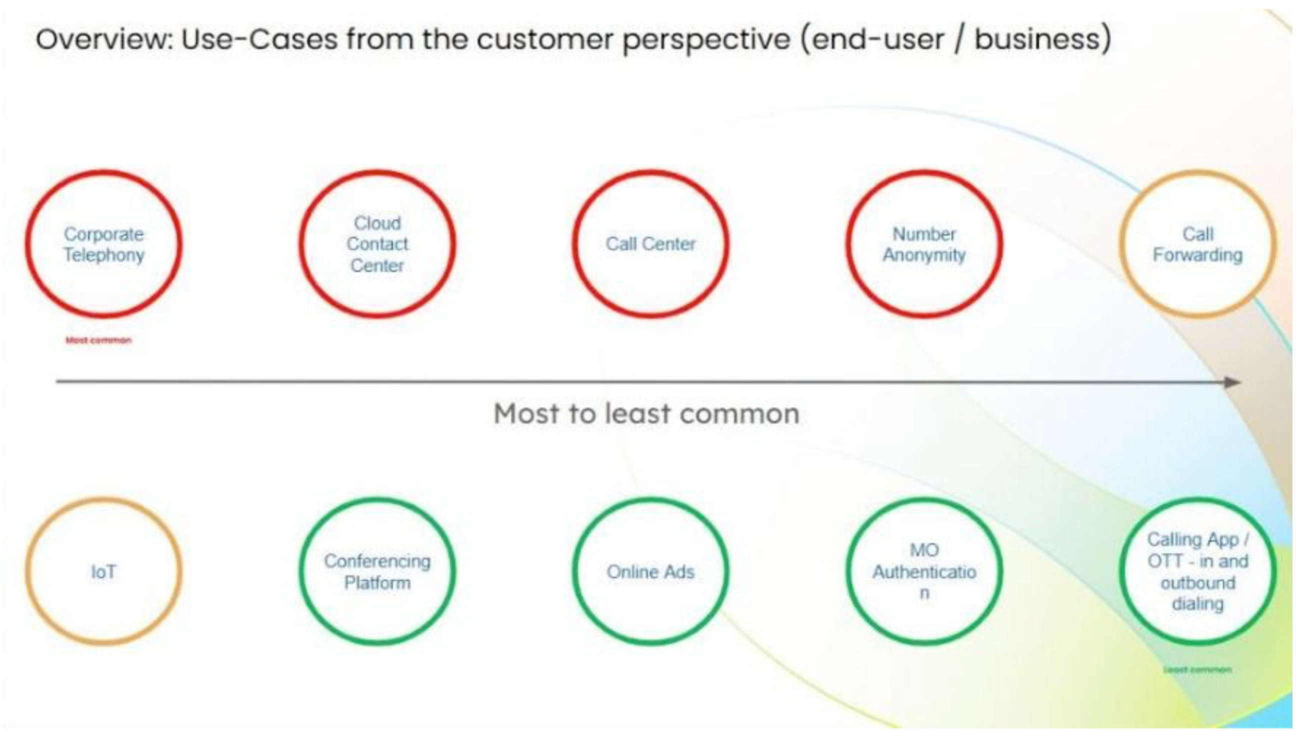
Of course, the tremendous increase of “use” of these feature rich services is ultimately based on a driven forward by end user choice. End users want modern communications services that fit their lifestyles and choices.

However, needless to say, the beneficial macro-economic and societal gains can only be realised in a regulatory environment that understands and supports modern voice communications use cases.

Cloud Number Use Cases

As stated above, differentiating number uses in a modern – cloud – setting from more traditional use, is not without its challenges. Additionally, the creation of any list in a market as flexible as that based on all-IP infrastructure and as rapidly developing as it currently is, any list is likely to become out of date or inaccurate very rapidly; likewise, any regulator that establishes a regulatory framework with sole reference to such a list (or assumption it will not change) will end up with a market that stifles innovation and competition and the values to the market these bring.

However. for the purposes of listing a range of use cases where telephone numbers have been 'transferred' away from the end-user to the 'cloud', we provide the below details[7]:

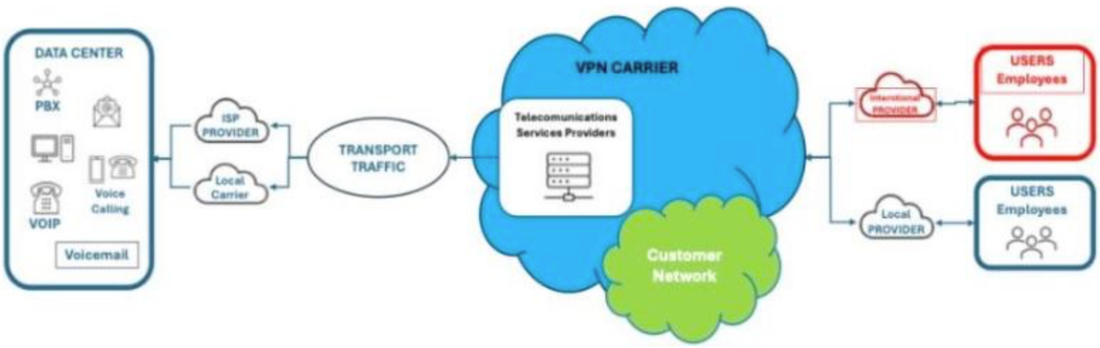


Corporate Telephony

Use cases: Most common

Corporate Telephony

- Corporate telephony refers to the **telephony infrastructure** used by companies to manage and **enhance** internal and external **communications**.
- It typically includes services such as **voice calls, voicemail** and other **unified communications systems** (e.g. VoIP, PBX systems).
- It is a replacement for the **PSTN**, which provides business telecommunications services over SIP trunks.

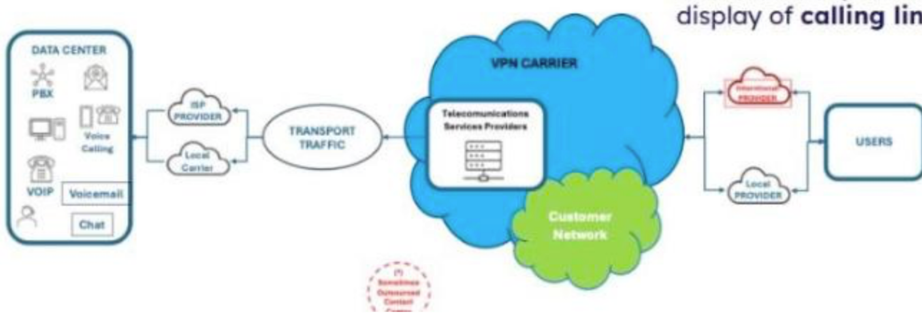


Cloud contact centre

Use cases: Most common

Cloud Contact Center

- A Contact Center in the cloud is a **system** that is accessed through the Internet and from which all the **company's communication channels** with customers (Omnichannel - voice, chat, email) are **managed**.
- Some of these contact centers may be **outsourced**, being operated by third-party providers and may not even be located in the same country as the company they represent.
- Using local numbers from the customer's region, **PAI (P-Asserted-Identity)** and from headers in **SIP signaling** will differ to maintain compliance and ensure proper display of **calling line identification.**

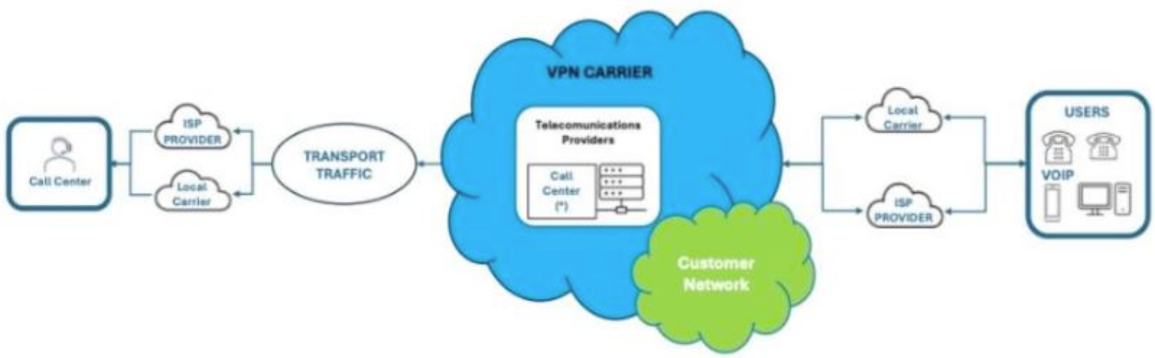


Call centre

Use cases: Most common

Call Center

- Customer communication platform, cloud numbers and inbound calls allow customers to access the contact center (typically **inbound voice services** only).
- But that **can include CPaaS-type solutions** where inbound and outbound numbers can be assigned to various services provided through the CPaas platform that provides API integration and custom-coded call flows.

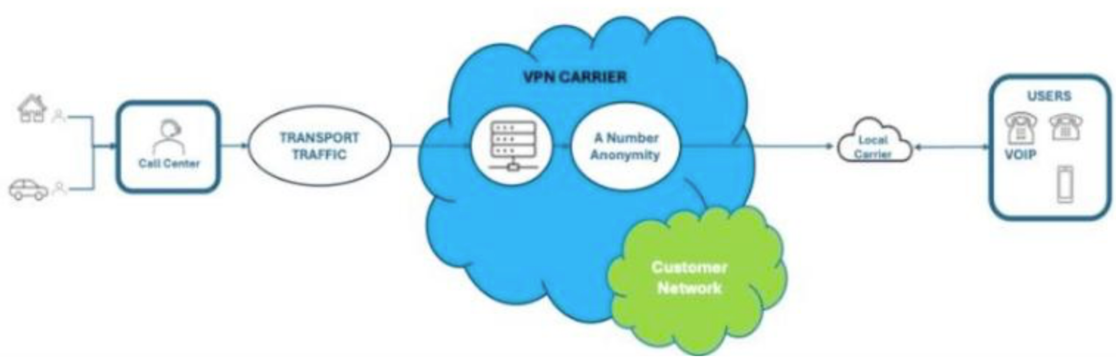


Privacy enhancement

Use cases: Most common

Number Anonymity

- Service requiring a **pool of numbers to anonymize** caller identification.
- Identity mask is **widely used** by **platforms** that facilitate communication between users (e.g., users and service providers) without exposing their personal phone numbers. The service acts as an **intermediary**, ensuring that both parties can communicate while their real phone numbers remain hidden.



Call forwarding / IoT

Use cases: Common

Call Forwarding

- Service requiring a **pool of numbers**, for instance, call forwarding is used to route the call to a server to **track and collect metrics** regarding the profile of the calls (e.g., **call duration, caller location, time of day, call volumes**).
- This service is **often used by businesses** for marketing campaigns, customer service, or contact centers to **monitor and optimize the performance** of their communication channels.

IoT

- There are some **special projects** that require **case-by-case analysis**. Niche cases related with **remote devices** where **DIDs** could complement **IoT** or **mobile connection**.
- Numbers provided for IoT (**IP end points**) devices (i.e. cars, eolic station, vending...)

Conferencing platform / Online Ads

Use cases: Least common

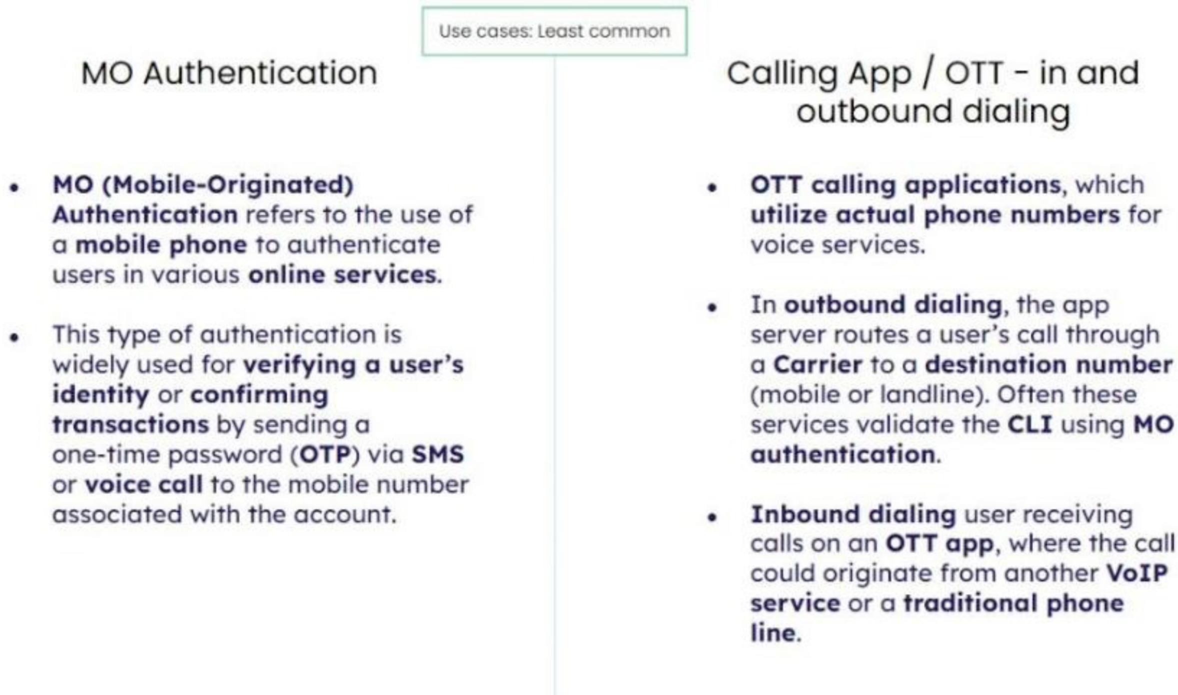
Conferencing Platform

- **Audio conferencing** allows users to join the audio portion of meetings from anywhere using a **dial-in number** or to invite anyone from anywhere using a **dial-out number**.
- Operators, apart from offering the termination of these calls, can offer **numbering (DIDs)**.
- **UC companies** use this service; the platform calls participants using numbers that do not necessarily belong to the participants themselves and often may not support **dialing back** to the number that originated the call.

Online Ads

- **Click-to-Call services** enable users to initiate a phone call directly from a **web page or application** by clicking on a button.
- It is a commonly used feature in **online ads**, **user support platforms**, or **websites** where users can quickly connect to businesses.

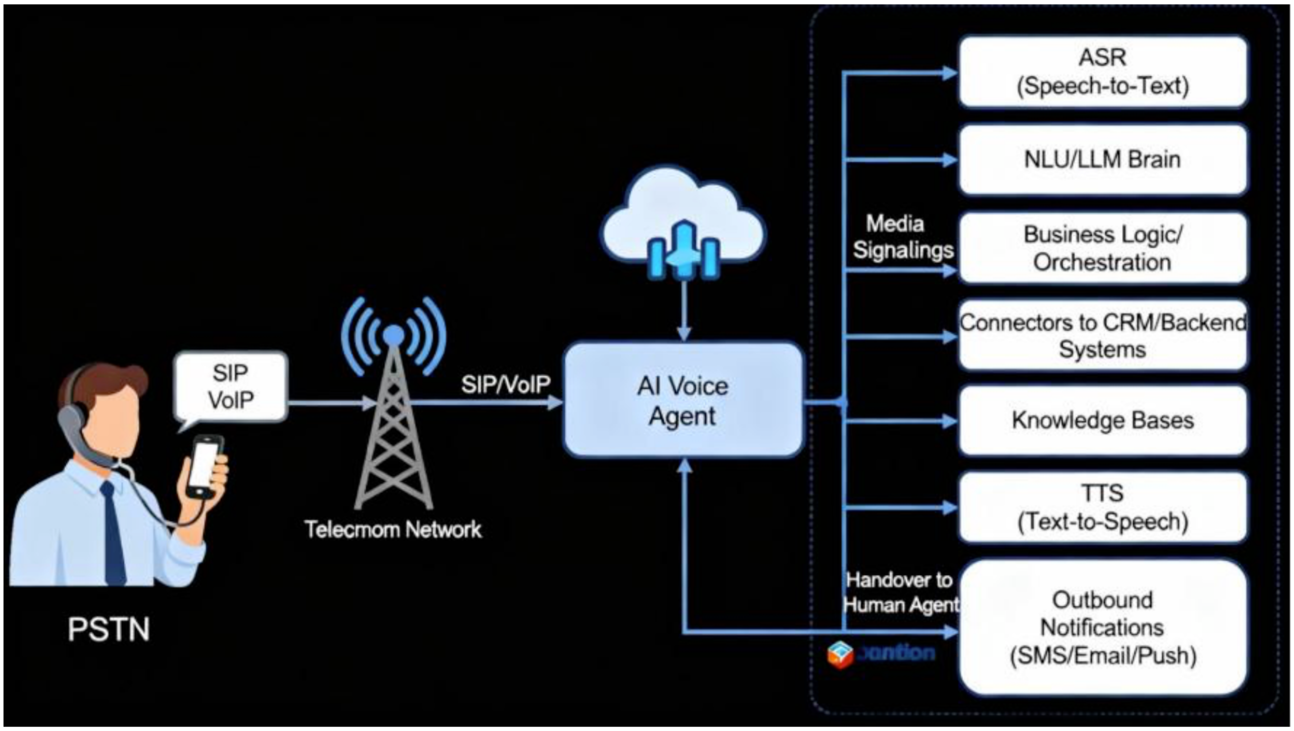
Mobile origination authentication / OTT calling apps



Whilst the objective of this paper merely to intend to show and explain some of the most common uses of cloud numbers, one should appreciate that new use cases emerge on a regular basis and NRAs are encouraged to permit this innovation to continue. Any regulatory intervention affecting this end user driven, natural technological and feature evolution in the marketplace should be, if at all, conditioned by regulatory intervention only if such is necessary to safeguard end-user, objectively justified and proportionate to this end.

As an example of emerging use cases that are forecasted to make a tangible impact on the external market:

Direct-to-consumer AI voice agent



All of the above use cases of cloud numbers demonstrate the wide variety of functionality offered to the markets and end-users. However, when assessing the correct regulatory framework for the future, it should be borne in mind that many of the use cases and regulatory areas to consider have already been explored and are not new.

For example: PBX services have transitioned to what is now called the 'cloud' for at least 20 years and IVR technology has performed a very basic related service to that of cloud driven contact centre / AI contact centre. As such, taking a negative approach to the regulatory framework for services making use of cloud numbers, could force unravelling multiple decades worth of established commercial use. The disruption to the industry and the macro economic as well as societal losses would be catastrophic.

Similarly, some NRAs find it challenging to accept 'Number Anonymity' as a valid and societally useful use case. On this, we note that many NRAs do however permit (in fact make it a regulatory obligation if caller requests it) 'CLI withheld' functionality. This, of course, already represents 50% of the 'Number Anonymity' functionality and has again been available for several decades. Many NRAs across the world have issued guidance on market valuable use of Anonymization and we, One Consortium, would be more than happy to discuss these with CEPT and its members.

Therefore, cloud phone numbers offer a modern solution for both businesses and individuals looking for efficient and versatile communication options. The functionality that these numbers offer have been available in the market place – initially labelled 'virtual numbers' - for at least two decades and CEPT as well as its members should focus on the uses these numbers have and the valuable impact to today's market they offer, not technological configurations.

Conclusion

Cloud numbers should be understood as a form of telephone number use within an all-IP and cloud-based communications environment, rather than as a wholly distinct regulatory species. The policy question is therefore not whether such numbers fall outside the numbering framework, but how the framework should be applied in a technologically neutral manner that reflects their virtual, dynamic, and cross-border characteristics.

The evidence in this paper indicates that demand for cloud numbers is being driven by structural market change, including the transition from TDM to IP, the rise of cloud communications platforms, remote and hybrid working, platform-based services, and emerging AI-enabled use cases. On the supply side, cloud-based allocation and routing can improve utilisation of finite numbering resources, support more efficient market entry, and enable a broader range of services than legacy, line-bound assignment models.

Accordingly, regulators and number administrators should avoid rigid classifications based solely on historical technical assumptions or physical association. Instead, they should ensure that numbering policy supports innovation, interoperability, competition, and consumer benefit, while maintaining proportionate safeguards to address fraud, misuse, and other legitimate public policy concerns.