THE UNITED REPUBLIC OF TANZANIA

TANZANIA COMMUNICATIONS REGULATORY AUTHORITY

Future Trends in Number Charging: Preparing for IoT and Emerging Technologies

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Agenda

1. Introduction
2. Numbering charging methods
3. Growth of IoT and Emerging Technologies
4. Future trends in numbering Charging
5. Recommendations

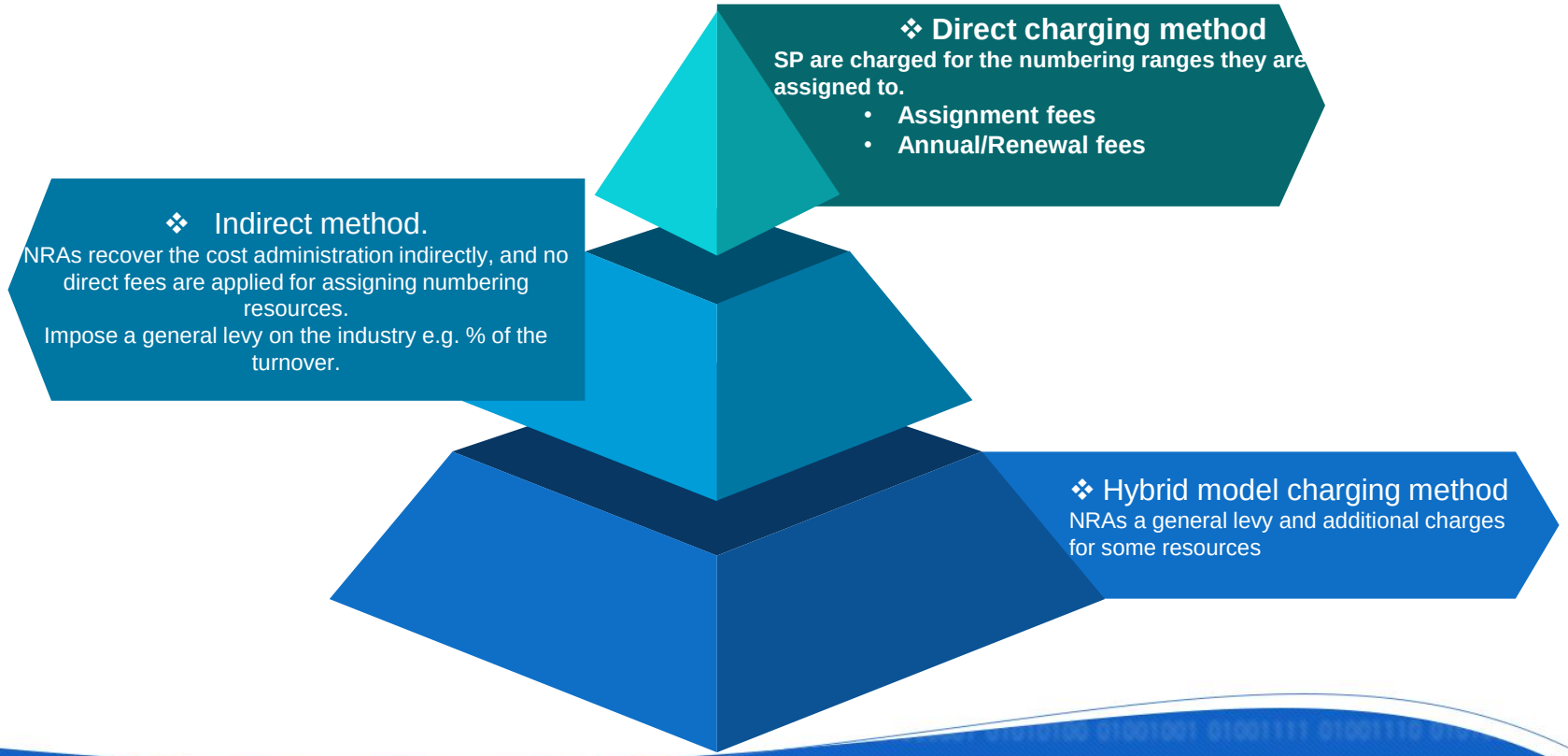
1. Introduction

Numbering charging refers to the regulatory framework that govern the cost associated with allocation, use and management of numbering resources by Service providers

Why do the NRAs charge numbering resource ?

1. Efficient Resource Management
   - Prevent misuse and hoarding
   - Encourage efficient utilization.
2. Administrative cost recovery.
3. Promote fair competition
   - Ensure fair access to numbering resources
   - Provides transparency
4. Source of revenue
   - To support broader regulatory functions
   - To fund telecommunications services in underserved or rural areas (universal communication service access)

2. Numbering charging methods



3. Growth of IoT and Emerging Technologies

- ✓ IoT definition as per ITU-T Y 4000 former Y 2060.
- ✓ IoT is based on the Internet technologies.
- ✓ Convergence of telecom and Internet.

The explosive growth of IOT devices

>>> The number of IoT devices is projected to reach **75 billion by 2030**, up from about 15 billion in 2021. This growth is driven by increasing affordability and advancements in sensor and connectivity technologies.

>>> The widespread use of emerging technologies such as AI, 5G, and big data amplifies the potential of IoTs.

These trends highlight the importance of preparing for a more flexible, scalable, and secure numbering and charging ecosystem to support IoT and emerging technologies effectively

4. Future trends in numbering Charging

1. Expansion of Numbering Resources

The exponential growth of IoT devices will place significant pressure on traditional numbering plans.

Impact: NRAs may need to introduce larger number ranges (e.g., longer numbers) or alternative identification systems to accommodate billions of devices such M2M numbering plans.

2. Device based numbering plans

Unlike humans, IoT devices do not require traditional phone numbers but unique identifiers for communication

Impact: The focus will shift from traditional E.164 numbering plans to alternatives like IPv6 addresses, SIM-based identifiers, or digital certificates

4. Future trends in numbering Charging...

3. Interoperability for Global Connectivity

IoT devices often operate across borders, requiring seamless international connectivity

Impact: NRAs and telecom operators will need to standardize numbering schemes and charging frameworks to ensure interoperability globally.

4. Shift to Non-Geographic Numbers

devices often require connections that are not tied to a specific location.

Impact: Numbering systems will increasingly adopt non-geographic numbers that enable mobility, scalability, and flexibility in a global context.

4. Future trends in numbering Charging...

5. M2M and A2P Charging

IoT involves a significant amount of M2M and A2P communication.

Impact: Charging models will evolve to accommodate these use cases, with differentiated tariffs for M2M and A2P traffic

Current numbering regulations are tailored for human-centric communication.

Impact: NRAs will need to update frameworks to address IoT-specific challenges, such as scarcity of resources, dynamic allocation, and global compatibility.

6. Regulatory Evolution

4. Future trends in numbering Charging...

7. Dynamic Number Allocation

Many IoT applications, such as smart utilities, only require temporary connectivity.

Impact: Numbering systems will support on-demand, dynamic allocation for short-term use, improving efficiency and reducing wastage of numbering resources.

8. Focus on Security and Privacy

IoT The vast network of IoT devices is susceptible to cyber threats.

Impact: Numbering frameworks must integrate robust security features to prevent misuse and ensure privacy.

5. Recommendations

Adoption new charging models

.Usage based charging (pay as you use)

.Per device charging (Flat fees for low-data IoT devices)

Collaborate Globally

-Work with international bodies to standardize numbering and charging.

Accelerate adoption of IPv6

-Ensure systems can handle the massive address space required

Develop Flexible regulatory framework.

-Create regulations that accommodate dynamic and temporary numbering plans.


THANK
YOU!

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