



Draft Licensing Framework for Terrestrial IoT Services

Strategy & Development



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PAKISTAN TELECOMMUNICATION AUTHORITY
PTA H/Q F-5/1, Islamabad

1 Introduction

The Pakistan Telecommunication Authority (PTA) is mandated, in accordance with the Telecommunications Act and Government Policies; to regulate the telecommunications sector in the country. Considering the international trends and insight of the GoP, a need is felt to formulate a regulatory framework elaborating requirements for developments of IoT ecosystem in licensed as well as unlicensed bands in the country.

The objective of this framework is to provide a regulatory guideline for the industry, to enable the development of IoT/ M2M eco-system in Pakistan, either through a list of Un-Licensed / shared bands, that may be used for Low Power Wide Area Networks (LPWAN), on non-interference and non-protection basis, or through exclusively Licensed frequency bands. However, the main emphasis of this framework is to elaborate on the requirements and guidelines for provision of IoT services in Un-Licensed frequency bands.

2 Definitions

The words and expressions shall have the meaning as assigned to them here under. However, in the framework, unless the Context or Subject otherwise requires the words and expressions used but not defined herein, shall bear the same meaning as given in the Act or the Rules.

- i. **Internet of Things (IoT):** Global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies. ¹
- ii. **Low Power Wide Area Networks (LPWAN):** Wireless wide area network technologies that interconnect low bandwidth, battery powered devices with low bit rates, over long range.
- iii. **IoT Mission Critical Services:** Services where the degradation in requirements of reliability, availability and end-to-end latency shall jeopardize the mission.
- iv. **Indoor:** Areas located within personal premises that are used for noncommercial purposes (houses, private compounds, universities, etc.).
- v. **Outdoor:** Areas located outside the personal premises (streets, public areas, parks, etc.).
- vi. **Short Range Radio Communication Devices (SRDs):** Radio devices operating over short distance i.e. indoor or the range of maximum 100m for outdoor connectivity at low power, having little potential to cause interference to other radio equipment and its communication remains local/standalone and is not connected directly to any public switched telecommunication network.
- vii. **Local Access Provider (LAP):** Means any licensed provider of information technology and Telecommunication Access Infrastructure for last mile connectivity, whether in the form of wires, cables (any sort), optical or wireless transport media and external to any private premises which crosses or runs alongside - public roads, highways, motorways, expressways, causeways, bridges, overpass, underpass, desserts, rivers, railroads, public or commercial buildings airwaves, space etc. A Local Access Provider can only be a licensed LL, GMPCS, Cellular or PTCL service provider who can also provide switching.

¹ <https://www.itu.int/en/ITU-T/gsi/iot>

3 Proposed Regulatory framework for Terrestrial IoT Services

3.1 Licensing

Most of the IoT applications can be realized in radio frequency bands including cellular band(s), internationally harmonized bands for Short Range Devices and ISM bands etc. Each band, depending upon its characteristics, has its own use case. Therefore, IoT licensing framework for service provisioning is, principally, classified according to the frequency bands involved for service provisioning, stated as below:

- i. IoT services provided through exclusively assigned/ Licensed frequency bands.
- ii. IoT services provided through shared frequency/ Un-licensed frequency bands, further categorized as:
 - a. IoT services through Short Range Devices-Bands (SRD-bands) and/ or Ultra-Wide Band (UWB)
 - b. IoT Services under Class LPWAN License/ Authorization

3.2 Service Provisioning

3.2.1 IoT Service Provisioning Through Licensed Frequency Bands

- i. Cellular and other licensees may provide IoT services through their exclusively licensed frequencies under respective license conditions, and/or any other conditions as specified by the Authority from time to time.
- ii. Mission Critical Services shall be offered through exclusively licensed frequency bands under the terms and conditions of such license or any other conditions as specified by the Authority from time to time.
- iii. The IoT service provisioning through exclusive assignment may be dealt on case to case basis.

3.2.2 IoT Service Provisioning through Un-Licensed Frequency Bands

- i. **SRD-Bands-- License Exempt-Type Approval Required Category:**
 - a. The radio frequency spectrum specified for such use cases shall be exempted from licensing, provided its operations are within approved technical standards/limits as specified in the respective framework for SRD. The communication remains mostly indoor, and/or effective within an outdoor range of 100m, and not connected directly to any public switched telecom network.
 - b. The SRD use shall require Type Approval (TA) as a mandatory requirement from Authority, pursuant to prevailing Type Approval Regulations.
- ii. **LPWAN License/Authorization**

The licensee of LPWAN shall:

 - a. Provide the IoT-specific connectivity in a given area of service (AoS), through the frequency bands as specified in Annex-A., with strict compliance to respective power limits.

- b. Shall transport the backend traffic generated through LPWAN network, to the cloud/ internet or to servers geographically separated from LPWAN base station, through a PTA licensed Local Access Providers.
- c. The duration of license shall be for Five (05) Years, renewable for other term(s) consistent with the policy of Federal Government.
- d. The licensee shall pay the fee as per the schedule given in Annex B of this framework.

3.3 Radio Frequency Spectrum

i. IoT Services through Exclusively Assigned/ Licensed Frequency Bands

- a. Exclusively assigned/ already licensed frequency bands shall be governed as per the respective license conditions, and/or any other conditions as specified by the Authority from time to time.
- b. Exclusive allocations for IoTs in any other frequency band shall be dealt on case to case basis, in the bands as specified by GoP from time to time.

ii. IoT Services through Shared/ Unlicensed Licensed Frequency Bands

The shared/ un-licensed frequency bands as referred in SRD Framework and Annex-A of this framework for LPWAN shall be used on:

- a. Secondary basis i.e. the networks operating in these bands shall not cause interference to other authorized primary radio communication services
 - b. Shared/ non-exclusive basis i.e. the users of these networks shall not ask any protection from interference caused by the current or future primary/ secondary users and be able to tolerate any interference caused by other radio-communication services, electrical or electronic equipment.
- iii. On occasion of interference to primary services, a user of an Un-licensed frequency bands shall stop the use with immediate effect, on direction of the Authority.
 - iv. The bands for IoTs shall be reviewed by the PTA/FAB from time to time, in the light of international best practices and based on the uptake of any demand from the industry.
 - v. The user shall comply with any future updates to the national frequency plan and the related technical specifications.

3.4 IoT Equipment

The following requirements must be complied for IoT equipment:

- i. The Licensee shall not install or connect, or permit the installation or connection of, any Terminal Equipment unless the Terminal Equipment is (a) type approved, or otherwise permitted by the Authority, (b) type approved by a recognized telecommunication equipment type approval agency or a recognized telecommunication equipment testing laboratory in a member country of the Organization of Economic Cooperation and Development (OECD).
- ii. The Licensee shall not install or connect, or permit the installation or connection of, any Terminal Equipment or type of Terminal Equipment prohibited by the Authority.
- iii. All the equipment used to provide IoT services must comply with Type Approval Regulations issued by the Authority from time to time.
- iv. The devices (Sensors, actuators, aggregators, appliances etc.), used in deployment of network under LPWAN license, shall comply with the International Commission on

Non-Ionizing Radiation Protection (ICNIRP) guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields.

- v. Provided that where the Authority has not prescribed any Cyber Security/technical standards for any type of terminal equipment, the technical standards laid down by following standardization bodies may be adopted:
 - a. ITU Telecommunication Standardization Sector (ITU-T).
 - b. European Standards (EN).
 - c. The International Electro- Technical Commission (IEC) and its International Special Committee on Radio Interference (CISPR).
 - d. The European Committee for Electro Technical Standardization (CENELEC).
 - e. The European Telecommunications Standards Institute (ETSI).
 - f. Occupational Health and Safety Assessment Specification (OHSAS).
 - g. International Organization for Standardization (ISO)
 - h. Directive 2014/53/EU for Radio Equipment Directive (RED)
- vi. The Authority may recognize the test reports issued by world-renowned laboratories duly accredited by the accreditation council within the originating country.
- vii. The IoT equipment shall have the capability of ‘reset to the factory settings.
- viii. Reconfigurable over the Air (OTA) E-Sims, with local subscription shall be permissible. Any special case shall be considered on case to case basis.

3.5 IoT Identifiers

- i. The numbering range shall be used as per the National Numbering Plan. “Number Allocation & Administration Regulations, 2018” shall apply including amendments/modifications made thereto, by the Authority, from time to time. However, the requirements, based on the uptake and growth of IoT applications, shall be reviewed by the Authority from time to time.
- ii. The suitable IP addressing is permissible, however, migration to IPv6 is highly encouraged.

3.6 Data Management

The licensees providing the IoT services must:

- i. Save and maintain the data of at least Twelve (12) Months, for provision to the Authority, as and when requested.
- ii. Comply with all the existing or future published laws, regulations and requirements issued by PTA or other authorities concerning data management including security, privacy and protection of customers’ data.
- iii. Licensee must report the data breaches (if any) to the Authority within a Five (05) working days, after becoming aware of such a breach.

3.7 General Conditions

- i. Licensees must adhere to all PTA regulations, decisions, guidelines, and instructions issued by the Authority from time to time.

Annex A- Frequency Bands for Long Range IoT

S.No	Frequency Band	Max. Output Power	Remarks
1	433.05-434.79 MHz	2W	
2	920-925 MHz	2W	Protection of primary services operational in adjacent frequency bands shall be ensured.

Annex B- Fee Schedule for LPWAN License

License Type	Application Fee	Initial License Fee	Annual License Fee (Per Base station)	USF & RND	Duration
Area of Service	PKR. 10,000/-	PKR 100,000/-	PKR 10,000/- per Base Station	-	5 Years

Note: In case of amendment/updates in the network of existing license/authorization, additional charges shall apply in following manner:

Additional 20% of Initial License Fee (ILF) will be levied & charges w.r.t additional base stations (annual charges) added in amendment license/authorization will apply from the date of amendments made.

Comments/ Feedback:

- The Authority would like to seek comments and views of the members of the PTA Industry Working Group on IoT, the concerned industry and the general public, on the draft regulatory framework for IoT.
- Supporting material (if any) may be attached as Annexures.
- This consultation will be opened for a period of four (04) weeks, and will close on **August 6, 2021**. All submissions must reach PTA by the deadline.
- Soft copy of the submission in both Adobe PDF and Microsoft Word format positively be provided through email at iot-wg@pta.gov.pk, with optionally a print copy to Director (Strategy and Development) PTA HQs, F-5/1, Islamabad Pakistan.
- The parties other than the members of the IoT- Working Group, submitting comments should include their personal / company particulars as well as the correspondence address, contact number and email address on the cover page.
- All the comments received would be analyzed and appropriately be considered while finalizing the document.