WHAT IS NB-IoT?

Narrowband IoT also known as LTE Cat NB1 is a Low Power Wide Area (LPWA) Technology that has been developed to enable a wide range of devices to be connected to the internet using existing mobile networks. NB-IoT operates in the guard bands of LTE, which is the network equivalent of driving down the shoulder on a super busy freeway.

1. Many NB-IoT use cases are currently using 2G/3G networks. Which are gradually being turned down by all major US Carriers.
2. Is ideal for “things” that require small amounts of data, over long periods, in hard to reach places.
3. Offers better battery life than legacy technologies & more affordable than technologies like CAT-M
4. Can carry data with greater efficiency and performance and never compete with other data traffic for network resources.
5. Due to the architecture of NB-IoT, it offers optimized data consumption and greater security.

NB-IoT VS CAT-M1 VS CAT-1

	NB-IoT	CAT-M1	CAT-1
Use cases	Smart parking, smart metering etc.	Fleet management, regulated smart metering, wearables etc.	Larger data volume UCs like LTE
Data volume	Kilobytes	Megabytes	Gigabytes
Data transfer	DL: max 250 kbps (mean rate 21 kbps) UL: max 230 kbps (mean rate 63 kbps)	DL: max 1 Mbps (mean rate 375 kbps) UL: max 1 Mbps (mean rate 300 kbps)	DL: max 10 Mbps (mean rate 1 Mbps) UL: max 5 Mbps (mean rate 0.5 Mbps
Latency (one way)	<10 sec	<1 sec	<50 msec
Mobility	Cell reselection	Handover	Handover
Indoor coverage	Maximum indoor coverage possibility (+20dB)	Very good indoor coverage possibility (+15 dB)	Similar coverage possibility as GSM (+0 dB)
Voice/SMS	No voice support SMS supported (Q3 2018)	VoLTE support SMS supported	VoLTE support SMS supported
Battery lifetime	Up to ≈10 years	Very long (5–10 years)	NA

NB-IoT KEY BENEFITS

BETTER BATTERY LIFE

- Longer battery life for devices not connected to a power source
- Cheaper device cost

OPTIMIZED DATA USAGE

- Reduced IP header overhead
- 30–40% savings in data transmission vs IP

ENHANCED UE SECURITY

- No IP connectivity to UE during data transmission
- Application Server authentication with T-Mobile required before connecting to UE

BUFFER MT MESSAGES

- Ability to queue mobile terminated messages in network
- Deliver buffer messages when UE connects to network for guarantee delivery

DATA PROFILE FOR A NB-IoT DEVICE

	FUNCTIONALITY	NB-IOT/IP		
Business characteristics	Typical applications	Sensors, metering: Water, gas, air	Smart Infrastructure: City light, parking	Limited trackers: Smart bycicle, livestock
Traffic profile	Connections per day	Up to 2	Up to 48 (every 30 minutes)	Up to 240 (10 per hour)
	Proj. message size, bytes	50	100	150
	Size of user data per day (bytes) max	100 bytes per day 36500 bytes per year	4800 bytes per day 1.7MB per year	36000 bytes per day ~13MB per year
	Acceptable latency, S	20 to 60	10 to 20	< 10
	Location	No	Yes	Yes
	Mobility	Stationary	Mobile	Mobile

NB-IoT FEATURES AND BENEFITS

NB-IoT TECHNOLOGY
Maximizes battery life, deep indoor coverage and efficient on-demand communication

BANDS SUPPORTED
Band 2 and 4 at launch + Band 12 in Q4 2018

SIGNAL SUPPORT
IP and Non-IP

CE MODES (0, 1, 2)
Coverage enhancement modes, repeat the transmission based on configuration

POWER SAVE MODE
Device notifies network that it's entering a deep sleep mode

EXTENDED DRX SUPPORT
Enhances deep sleep and battery life

SMS CAPABILITIES
Allows strict device control and network initiation

CERTIFICATION
Modules and chipsets will be certified and use non-IP as preferred mode of data traffic

NB-IoT USE CASES

BUILDINGS

Access control, monitoring, and alarm systems

LIGHTING

Intelligent management of street lighting

PARKING

Navigates drivers to the next vacant parking spot

ASSET TRACKING

No lost suitcases anymore

METERING

Automatic remote reading of utility meters

WASTE MANAGEMENT

Emptying of containers based on their filling level

EQUIPMENT MONITORING

Localization and optimal maintenance of machines

DEVELOPERS COMMUNITY— TWILIO ENABLING THE LONG TAIL OF INNOVATION

NB-IOT DEVELOPER KIT

- T-Mobile and Twilio offer developers everything they need—SIM, APIs, modules, and demos— to start exploring the possibilities of NB-IoT

PROGRAMMABLE WIRELESS

- Delivers IoT connectivity that scales to the enterprise, and serves developers all over the world
- Control, analyze, and monitor cellular connectivity from your Twilio console or via Twilio API

- Get started fast
- Pay-as-you-go
- Streamlined SIM procurement
- Global coverage
- Trusted platform

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