

Release-13 Cellular IoT Deployments – December 2018



REGION	COUNTRY	OPERATOR	NB-IoT	LTE-M	LTE-Advanced Pro
Africa			1	0	0
	South Africa	Vodacom	1		
Asia & Pacific			11	10	1
	Australia	Telstra		1	
	Australia	Vodafone Australia	1		
	China	China Telecom	1		
	China	China Unicom	1		
	China	China Mobile	1		
	Hong Kong	Hutchison Telephone Co.			1
	India	Reliance Joi Infocomm	1		
	Japan	KDDI (au)		1	
	Japan	DOCOMO		1	
	New Zealand	Spark		1	
	New Zealand	Vodafone New Zealand	1	1	
	Singapore	M1	1		
	Singapore	Singtel		1	
	South Korea	KT Corp	1	1	
	South Korea	SK Telecom		1	
	Sri Lanka	Dialog Axiata	1	1	
Taiwan	Asia Pacific Telecom (APT)	1	1		
Taiwan	Far EasTone	1			
Eastern Europe			9	0	1
	Croatia	Hrvatski Telecom	1		
	Czech Republic	Vodafone Czech Republic	1		
	Estonia	Elisa	1		
	Hungary	Magyar Telekom	1		
	Latvia	Bite Latvia			1
	Kazakhstan	KaR-Tel (Beeline)	1		
	Poland	Polkomtel	1		
	Poland	T-Mobile Poland	1		
	Russia	Mobile TeleSystems (MTS)	1		
Slovakia	Slovak Telecom	1			
Latin America & Caribbean			0	1	0
	Mexico	AT&T Mexico		1	
Middle East			3	1	0
	United Arab Emirates	Etisalat	1	1	
	Turkey	Turkcell	1		
	Turkey	Vodafone Turkey	1		
U.S. & Canada			1	4	0
	Canada	Bell Canada		1	
	Canada	Telus		1	
	United States	AT&T		1	
	United States	T-Mobile US	1		
United States	Verizon		1		
Western Europe			14	4	1
	Austria	T-Mobile	1		
	Belgium	Orange	1	1	
	Belgium	Proximus	1		
	Belgium	Telenet	1		
	Denmark	TDC	1		
	France	Orange France		1	
	Germany	T-Mobile	1		
	Greece	Cosmote	1		
	Ireland	Vodafone Ireland	1		
	Italy	Vodafone Italy			1
	Netherlands	KPN		1	
	Netherlands	T-Mobile	1		
	Netherlands	Vodafone/Ziggo	1		
	Norway	Telenor Norway		1	
	Norway	Telia Norge	1		
	Spain	Vodafone Spain	1		
Ireland	Vodafone Ireland	1			
Totals			39	20	3
Global Totals			62		

Definition of 3GPP Release 13 LTE Cat-M1 and Narrowband-IoT for Cellular Internet of Things (C-IoT)

In 3GPP Release 13 standards, the development of Cellular-Internet of Things features was studied, along with other features for LTE-Advanced Pro. Although the Release 13 IoT developments of LTE Category M1 (Cat-M1) and Narrowband IoT (NB-IoT) are somewhat independent of other LTE-Advanced Pro network and core features in Release 13, by definition, deployment of these IoT technologies might be considered an LTE-Advanced Pro network.

In Release 13, the developing Cellular Internet of Things is addressed with LTE Category M1 (LTE Cat-M1) architecture that further reduces cost, improves range, and extends battery life of IoT devices. Release 13 also adds Narrowband-IoT capability with Category NB-1 and an IoT solution for GSM, called “EC-GSM-IoT,” that extends coverage by 20 dB. Category M-1 and NB-IoT devices could achieve battery life as high as 10 years.

- Rel-13 enhanced Machine-Type Communications (eMTC) introduces LTE Category M1 User Equipment supporting the broadest range of IoT capabilities, with complexity reduction and coverage enhancements to at least 155.7 dB Maximum Coupling Loss (MCL); data rates up to 1 Mbps utilizing only 1.08 MHz bandwidth; supporting full-duplex FDD, half-duplex FDD and TDD modes, and ability for deployment in any LTE spectrum. Cat-M1 can also support voice (through Voice over LTE (VoLTE) and full-to-limited mobility, and is designed to fully coexist with regular LTE traffic (Cat-0 and above).
- LTE Cat-NB1 (NB-IoT) scales down further in cost and power for low-end IoT user cases. NB-IoT User Equipment further reduces complexity and extends coverage to 164 dB MCL. NB-IoT is ideal for low-throughput, delay-tolerant use cases with low mobility support, such as smart meters, remote sensors and smart buildings. Cat-NB1 uses 180 kHz bandwidth and supports stand-alone, guard-band and in-band operation. NB-IoT is currently specified for LTE FDD, although some 3GPP member companies have expressed interest in specifying TDD operation in future releases. NB-IoT supports in-band deployment by utilizing a single RB within a normal LTE carrier. It can be deployed in a LTE carrier’s guard-band utilizing unused resource blocks while still minimizing interference with neighboring carriers. In standalone mode, NB-IoT can be deployed in re-farmed spectrum from GERAN systems utilizing standalone 200 kHz carriers. Thus, NB-IoT provides flexible deployment options to operators.

The figure below shows the scalability of LTE to meet a wide range of connectivity requirements including IoT.

Source: LTE and 5G Technologies Enabling The Internet of Things, 5G Americas white paper, December 2016

[More Deployment information](#)

