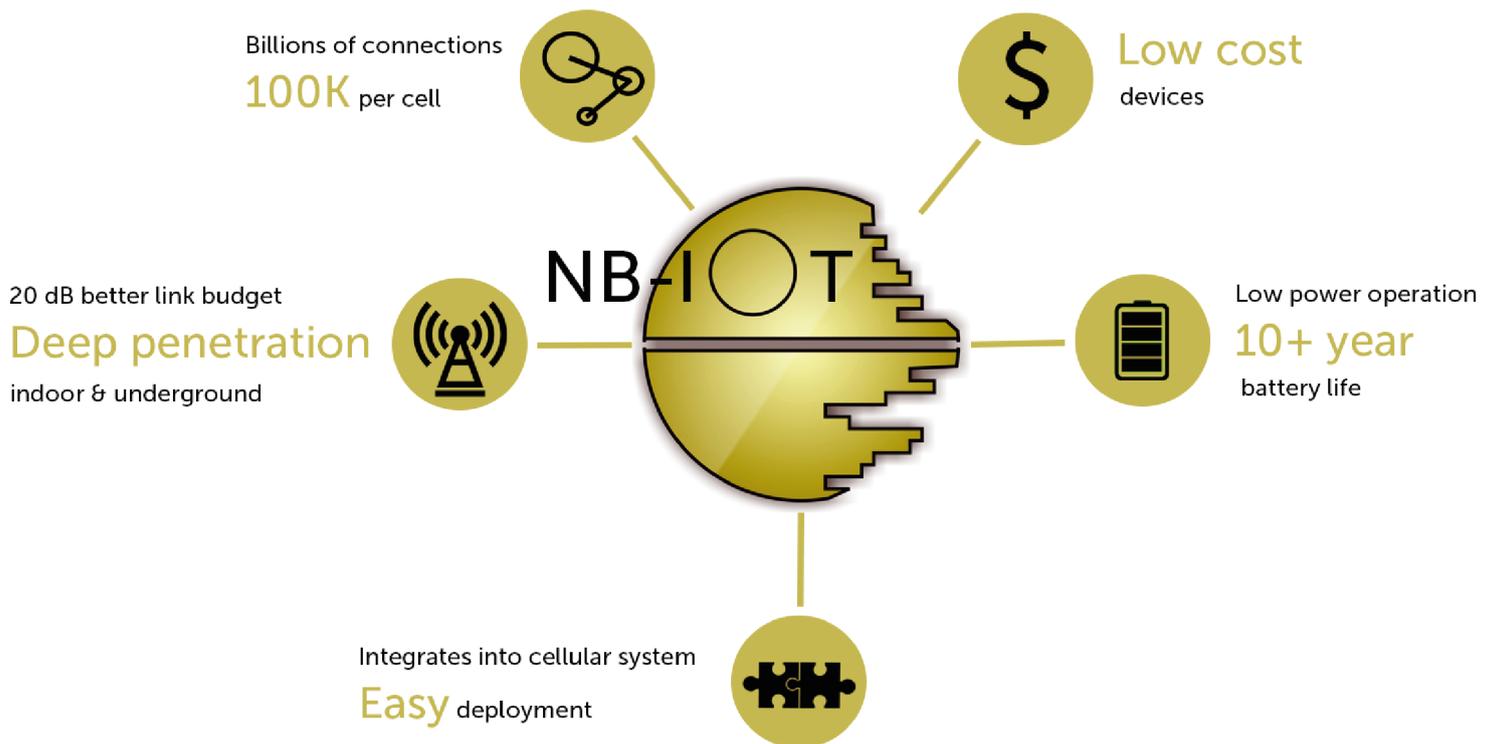


The Empire Strikes Back With NB-IoT



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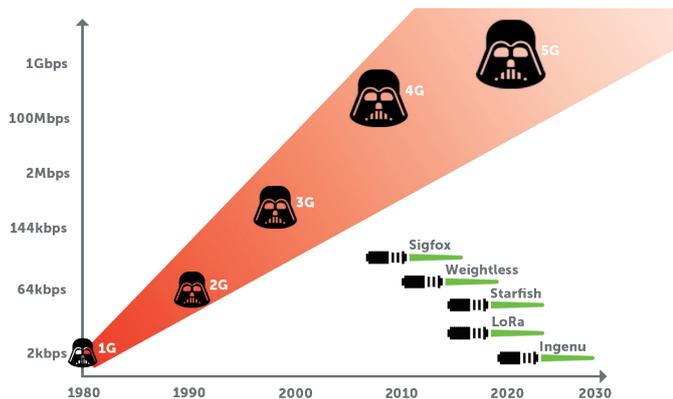
THE EMPIRE STRIKES BACK WITH NB-IoT

This thought piece is designed to help people understand why they should be selecting NB-IoT over LoRa or Sigfox for network logging devices, and expecting their suppliers to be ready to provide NB-IoT devices.

Each generation of mobile communications technology has brought big increases in data rate.

Generation	Capacity (data rate)
1G	2kbps
2G	64kbps
3G	144kbps - 2Mbps
4G	100Mbps - 1Gbps
5G	1Gbps - Unlimited?

This has been driven by what we all do with our mobile phones: use more and more data-intensive applications. That left a gap for large volume, low data rate, field-based, battery powered devices.



LPWAN TECHNOLOGIES

But the new LPWAN technologies that have filled the gap have challenges:

- Data rates are low
- Latency (the time between sending and receiving data) can be long
- Devices can fight with each other for communication space (known as "contention") on the unlicensed spectrum, and you won't have control over how many of these there are
- Not all offer full 2-way comms
- Proprietary rather than standards-based

- You need to deploy and maintain your own communications infrastructure, or share one with a few others, to make them work
- Security is not robust including for the SIM

The mobile communications companies aren't stupid and they spotted the gap that had been created and the newcomers who were trying to fill it. And they hatched their own plan to make sure they didn't lose out financially.

They took all the advantages that they have – high data rates, low latency, licenced spectrum, almost unlimited device numbers, their existing infrastructure, and high levels of security (the weaknesses of LPWAN) and married them with the strengths of LPWAN: great signal penetration, low power, and low cost.

They created NB-IoT – Narrow Band Internet of Things.

CAT-M1

CAT-M1 is worth a mention too. It is useful for devices that move (vehicle tracking applications for example). Both CAT-M1 and NB-IoT are in the 3GPP spec (the mobile operators' bible).

Application focus: M2M / Mobile connectivity

Radio spectrum: 1.4 MHz, 3GPP Licensed

Guaranteed QoS: Yes

Responsiveness: Milliseconds

Roaming: Global

Peak Data Rate: 1 Mb/s (DL/UL)

FOTA: Yes

Range/MCL: Basement/155.7 dB

Mobility: Vehicular (300kmh) (full handover)

Voice support: Yes, including VoLTE

Battery life: 5-10 years

Cost (Module or eBOM): \$

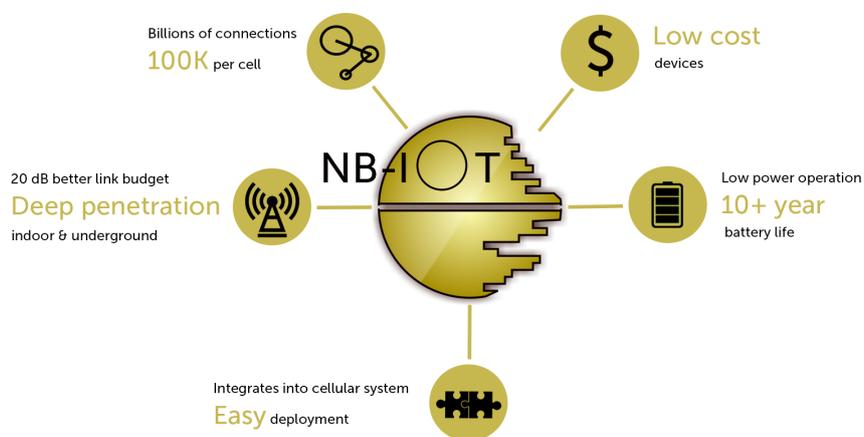
IN SHORT, THE EMPIRE STRUCK BACK...

Its NB-IoT Death Star took aim at the rebel forces massing on Alderaan.

If NB-IoT isn't already switched on where you are, it probably will be soon. If 2G and 3G aren't already turned off, they may be soon. So any plan for deploying devices on your water network will need to take account of this.

The key questions you need to ask are: who owns, manages and maintains the infrastructure; can I rely on them and for how long; and what area is covered?

i2O has already started deploying 4G NB-IoT loggers in various parts of the world, starting with Kuala Lumpur, Malaysia.



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