6 NB-IoT Applications

After the read, you will learn about what is NB-IoT, What are the features of NarrowBand-IoT, what are the NB-IoT applications.

What is NB-IoT?

NB-IoT (NarrowBand Internet of Things) is an emerging technology IoT based on the narrowband cellular things, support low-power device is connected to the cellular WAN data, is also known as a low-power wide-area network (LPWA).

NB-IoT consumes only about 180KHz band can be deployed directly to the GSM network, UMTS network, or an LTE network supporting short standby time, the network connection device requires a high connection efficiency.

NB-IoT uses a License band, the band can be taken to protect the three deployment or independent manner with other carriers.

NB-IoT with other wireless communication technologies distinction:

The degree of proximity information transmission distance, wireless communication technologies can be divided into short-range transmission techniques and a wide area of network transmission technology.

Short-range transmission technology includes two categories based on Wi-Fi and Bluetooth, represented by high-power, high-speed short-range transmission technology, mainly used in smart home and wearable devices and other scenes;

ZigBee is represented by low-power, short-range low-rate transmission technology, mainly used in a LAN networking scenario flexible device, such as a hot sharing.

The WAN transmission technology is also divided into two categories, but the classification criteria are whether the band is used by licensed spectrum.

NB-IoT technology belongs to licensed spectrum technology, mainly used in the remote operating states of the data transfer, the data terminal equipment, and industrial intelligent low power transmission, low-rate scenarios.

In addition, wide area network technology includes cellular communication technology for high-power, high-rate, mainly used in GPS positioning and navigation, video surveillance, real-time high transmission scenario requires a large flow rate, corresponding to the unlicensed spectrum technology is LoRa, Sixfox technology.

What are the features of NB-IoT?

NB-IoT technical advantages:

Massive connection: up to 100,000 connections per cell

NB- IoT 50-100 fold increase over the uplink capacity 2G / 3G / 4G, which means, in the case of the same base station, NB-IoT may provide 50 to 100 times the number of access than the prior art wireless.

Low power consumption: long battery life

Communication devices are often associated with the energy consumption amount or rate of data, i.e., the size of the sent packet size determines the power consumption per unit time. With a small amount of data, the modem device can be transferred to the amplifier and a very small level. Thus, NB-IoT focuses small amount of data, low-rate applications, such as power NB-IoT devices can do very small, can guarantee more than five years of battery life.

The depth of coverage: to achieve coverage than GSM high gain of 20db

NB-IoT LTE upgrade than 20dB gain, equivalent to 100 times the transmit power increase, i.e., 100-fold improved coverage, even where underground garages, basements, underground pipelines, and other signals can be difficult to reach cover.

Stable and reliable: provides access to carrier-class reliability, support effective IoT applications and smart city solutions

NB- IoT deployed directly to the GSM network, UMTS network, or an LTE network, the base station to the existing network and to reduce the cost of deploying complex, smooth upgrade, but using a separate 180KHz band, does not take up voice and data bandwidth of existing networks to ensure that the traditional business and future business of things at the same time stable and reliable conduct.

Security:

Inheritance 4G network security capabilities, support two-way authentication, and air interface encryption strict to ensure the security of user data.

Low cost:

Bring low-rate, low-power, low-bandwidth, low-cost advantage. Low rates do not need a large cache, the cache so small, DSP configuration is low; low power, low mean RF design requirements, small PA can be achieved; low bandwidth, we do not need a complex balancing algorithm.

These factors make NB-IoT chip can be made small, and the cost of the chip and the chip size is often related to the smaller size, lower cost, cost of the module also will be lowered.

What is NB-IoT used for?

NB-IoT is a narrowband radio technology used for M2M and Internet of Things (IoT) devices and applications requiring wireless transmission over a more extended range at a relatively low cost and using little power for long battery lives.

Below are the 6 NB-IoT applications in the industry

In low-speed things, NB-IoT is a new standard, to achieve the ultimate cost, coverage, power consumption, number of connections, and other technologies. The NB-IoT applications include public utilities, healthcare, smart cities, consumers, environment, agriculture, logistics, warehousing, intelligent buildings, manufacturing, and other industries.

1. Farm management in NB-IoT applications

With advances in technology, science and culture will become the future trend of development, animal husbandry and the use of GPS + GPRS positioning system can solve this problem.

But the cow, the sheep, individual large-scale, the situation GPRS communication base stations will have insufficient capacity, battery life will be a problem, are relatively remote farm Furthermore, the strength of the signal coverage will be a problem that could cause the data cannot be transferred ...

With NB-IoT technology, perfect solve a series of problems of NB-IoT applications

NB-IoT communication base station can accommodate user capacity is 10 times that of GPRS,

NB-IoT has low power consumption, normal communication and standby current is mA and uA level, module standby time of up to ten years, from birth to butcher all without the need to replace the battery, reducing the workload of workers.

NB-IoT has a stronger, wider coverage, the real remote areas of normal transmission of data.

The remote meter reading in NB-IoT applications

Water and gas and our lives, every household will use the most primitive way are artificial to-door meter reading statistics.

With the development of society, manual meter reading derived from a variety of drawbacks:

Low efficiency

High labor costs

Record data error-prone

Owners wariness of strangers will not be the door

Maintenance and management difficulties

GPRS remote meter reading and thus came into being, solves the problem of manual meter reading series, it is more advanced than manual meter reading technology, more efficient and more secure. Attendant new problems, GPRS remote meter reading also has the disadvantage of not large scale:

User capacity is small base station communication

High-power

Weak signal

The remote meter reading in NB-IoT applications is to solve this problem, NB-IoT inherited GPRS remote meter reading function also has massive capacity, the same base station communications subscriber capacity is 10 times that of GPRS remote meter reading.

NB-IoT has lower power consumption, under the same environmental conditions standby time NB-IoT terminal modules may be more than a decade, NB-IoT technology coverage stronger.

3. Well cover monitoring in NB-IoT applications

Is rapidly building our cities, underground municipal public infrastructure projects are set to

increase, the increase is inevitable covers, covers a huge role, such as not timely access to information covers state, will likely cause extremely on people's lives and property large losses.

At present, most cities are manual inspection to manage, but a large number of wells, limited manual inspection efficiency, are often unable to obtain timely and accurate information covers state, leading to all kinds of security risks:

Whether covers were stolen manhole cover is destroyed.

Not only covers theft or damage caused by direct losses of public property, but also may cause irreparable injury and economic loss in the vicinity of pedestrians and vehicles.

How to exclude these security risks become a top priority, using NB-IoT of covers for positioning monitoring and management, can grasp the covers state information, and move covers or use of NB-IoT network when it is destroyed alert notification management to the server so that the maximum the extent to avoid injury and damage-free.

Well cover monitoring in NB-IoT applications advantages:

No longer need manual inspections, all the data is automatically transmitted to the platform, saving a lot of human resources.

NB-IoT communication base station can accommodate user capacity is 10 times that of GPRS, the number of covers can meet the huge demand.

NB-IoT has low power consumption, normal communication and standby current is mA and uA level, module standby time of up to ten years, simplifies maintenance covers monitoring in a late great extent.

Well cover monitoring of NB-IoT applications has a stronger, broader signal coverage to indoor and basements can really achieve full coverage in monitoring wells.

NB-IoT technology to break through the bottleneck of GPRS technology, the future will shine in the wireless communications industry.

4. **NB-IoT applications in Smart Home (Smart Lock)**

As in recent years, the smart home industry is hot, the frequency of occurrence of intelligent lock in their lives have become more sophisticated, intelligent currently using the non-mechanical key lock as a technical user identification ID.

Mainstream technology has proximity cards, fingerprint identification, password identification, facial recognition, and so on, which greatly improves the security of access, but only if more security is energized if the intelligent lock in the power-off state is useless.

In order to enhance the security you need:

Smart Lock has a built-in battery;

Collect the basic data;

Transmitting data to the server;

Abnormal data collected automatically alerts to a user;

Since the smart lock is easily disassembled after the installation so requires an intelligent lock long battery life;

Position of the door in a closed corridor coverage, it is necessary to ensure more real-time network data transmission;

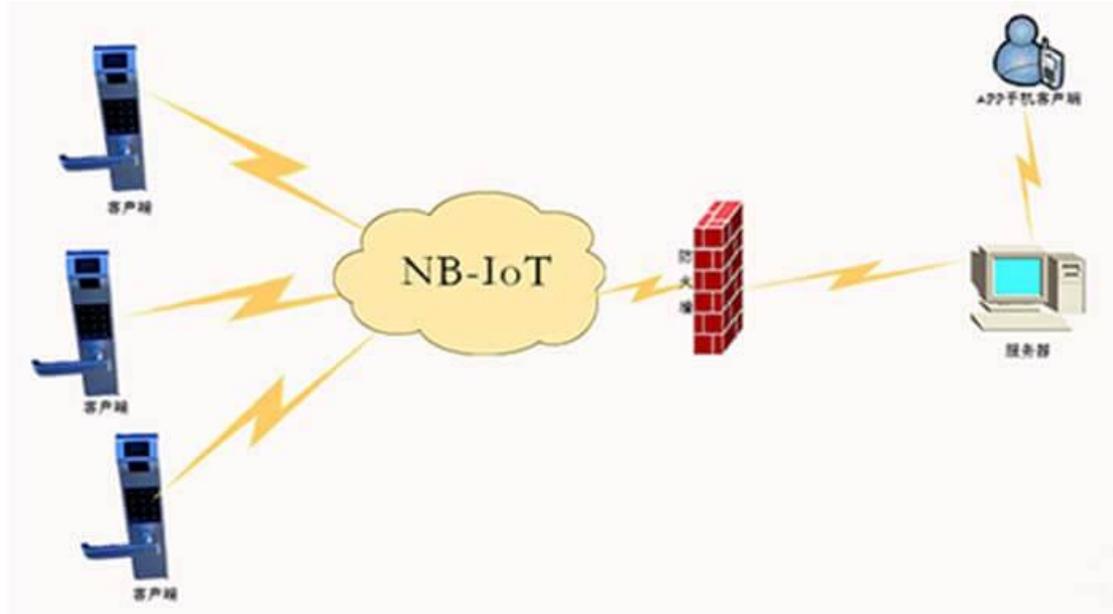More than the number of intelligent home terminals must ensure that sufficient number of

connections;

The most important is that after addition of the above functions, but also to ensure that the equipment costs at an acceptable range.

**NB-IoT applications in the smart home system**

NB-IoT has low power consumption, using only two AA batteries can stand for decades, greatly reducing maintenance cost, superior signal coverage covering indoor and basements to ensure the stability of the signal.

Mass connection, a plurality of terminals simultaneously satisfy the intelligent home connection.

Low-cost, single-chip NB-IoT price lower than $1.

5. **Street light monitoring in NB-IoT applications**
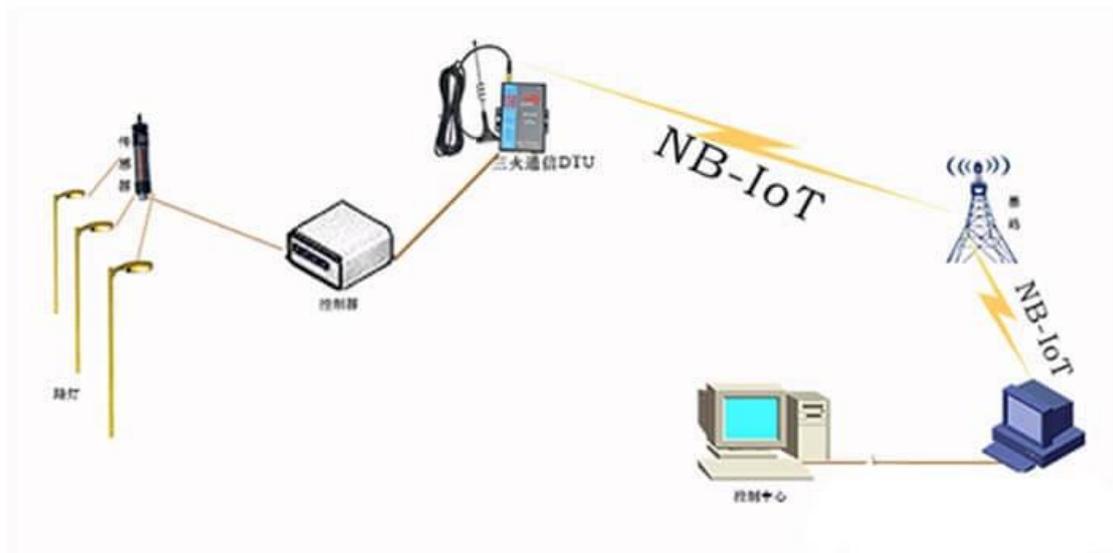
When night fell, the city in a variety of colorful street lights, the city covered with a beautiful coat,

in this beautiful appearance hides a huge drawback.

Energy waste

Because the city after the rest of the night into the night, people have started to break, begin to reduce the flow of people on the street, some sections do not need too much time in the special street lighting, resulting in energy waste, increase unnecessary costs;

Difficult to maintain

Due to the use of manual inspection requires a lot of manpower, and a large number of street lights, street lights cannot timely access to real-time status, resulting in failure to maintain lights, low efficiency of the investigation.

How to make intelligent streetlight management in NB-IoT applications?

NB-IoT applications intelligent street light management system monitoring center is the entire street light monitoring system operation, maintenance, processing, statistics, analysis, and supervision center.

Monitoring centralized data center management and monitoring, and targeting, to quickly find other operations support center monitoring management at different levels, may set up multiple sub-control centers, network management can be divided into pieces distinction, the formation of large-scale street lighting control system;

Custom control strategies, the control sub-period sides of the road lights full-on, full off, the partition bar lighting, street lighting control system can be flexibly adjusted according to the local circumstances of time, full-on, full off, lighting rod spacer;

NB-IoT applications using wireless networks, remote distributed remote control;

Fault detection lights, position lights actively reports a fault; large communication capacity,

Do not worry too much too dense streets cannot lead to individual communications.

6. NB-IoT applications in the fire (smoke detectors)
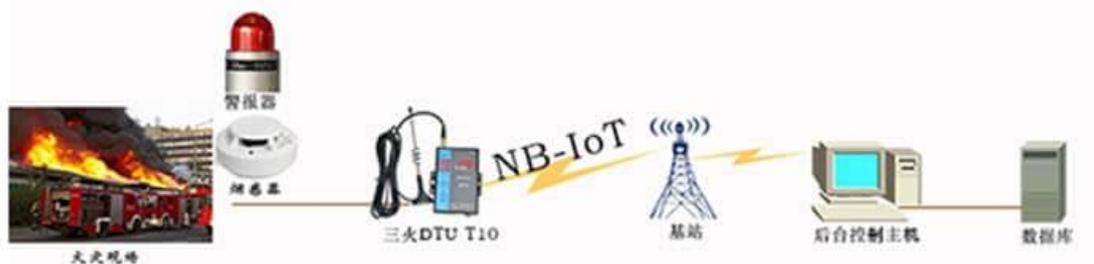
News reports often have a fire inside;

Every fire is accompanied by family members dead;

Every scene is shocking;

We need to raise awareness on fire, and the rational use of fire-fighting equipment in order to reduce losses and minimal damage.

Fire smoke sensor sentinel system, real-time detection of smoke, the smoke sensor detects excessive concentration, send information back to the server and start the alarm,

With loudspeakers and other related equipment, the server will automatically push information to the relevant departments and personnel to achieve fire safety intelligence.

In accordance with the fire protection requirements, intensive installation profile smoke detector in practical applications, and a large cost is inconvenient trace.

NB-IoT applications of the fire smoke detector using wireless smoke may take difficult to avoid the problem line, significant savings in installation costs;

NB-IoT has a huge number of connections, the smoke detector can simultaneously access more than one hundred thousand high, the smoke detector can meet the massive simultaneous access;

NB-IoT has low power consumption in standby mode can be years of work, greatly reduces maintenance costs after installation;

NB-IoT with superior coverage, covering indoor and to the basement;

NB-IoT ultra-low-cost estimated chip prices as low as $1.

NB-IoT apply to asset location tracking system

With the development of information technology and a variety of intelligent terminal equipment, personnel and asset locating demand will continue to heat up. Application location services sector also showed fragmentation characteristics, such as asset inventory wisdom parks, medical waste tracking process, pet positioning.

Today, the market tracker in most of the wide-area communications technology based on GSM, power consumption is a big problem. Large chip area, high cost, relatively low coverage, etc., and this technique happens positioning tracker needs contrary.

GSM technology is quite backward causing positioning tracker product experience is poor, and some national GSM networks already retired or are facing disconnection, resulting in the continuation of such products and technologies shortage.

Besides the six NB-IoT applications, there are also other NB-IoT applications for the IoT and M2M industries.

With the technology of NB-IoT applications, low power consumption and depth of coverage properties make up the many deficiencies of traditional communication technologies, in which either object or area of outdoor connection can be produced in a secret location for indoor positioning asset tracking.

NB-IoT applications with a low-power technology, wide coverage, low cost, small size, and other NB-IoT applications characteristics such that the field will become essential asset tracking communications.

Besides the 6 NB-IoT Applications article, you may also be interested in the below articles.

About Wi-Fi, You Did Not Know

What is the difference between WIFI and WLAN?

Summary of 41 Basic Knowledge of LTE

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