



Netvox IoT Solution for Building Automation

-- Wireless Communication as Reliable as a Wired System

For building automation, Netvox IoT-based solution costs 83% less than a wired solution, and the installation time is 90% less. What's even better is that the wireless communication is as reliable as a wired system!

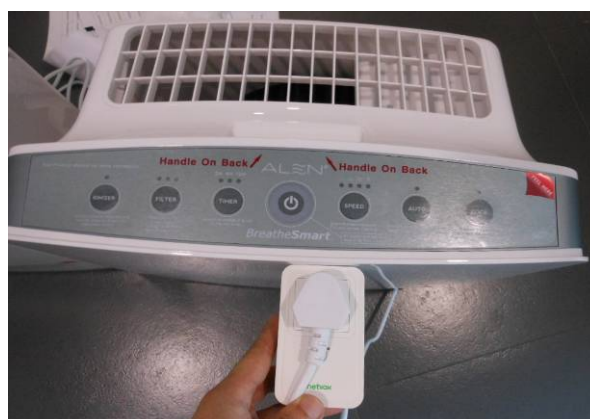
Zigbee: Low-power and self-healing wireless mesh network technology

Zigbee is an IEEE 802.15.4-based protocol. Compared with Wi-Fi and Bluetooth, Zigbee has many advantages such as high security, low-power, low-cost, and easy installation. However, due to the low latency of Zigbee, there are many doubts about whether Zigbee is suitable for applications that require large-scale mesh networks.

Is this really the case?

Successful Case

In September 2016, Netvox engineers headed to an European automobile manufacturer's headquarter in Beijing to assist in the installation of air purifiers, smart sockets and an wireless control system based on Zigbee.



Details of the installation site

Building A: Zigbee system installed from 2F to 6F

Building B: Zigbee system installed from 1F to 5F

Building C: Zigbee system installed on 2F

Building D: Zigbee system installed from 2F to 4F

The distance between these buildings is about 10 kilometers (6.2 miles) respectively.

Technical Difficulties

In this project, there are multiple Zigbee networks with only the gateway Z206 and smart sockets with power meter Z809A in the network. Every Zigbee network contains hundreds of smart sockets that provide real-time on/off control and status report as well as periodic transmission of energy consumption data. The network load is much heavier than a security-focused network where the devices do not transmit data frequently. The large number of nodes and frequent data transmission are great challenges for the low data rate Zigbee protocol.

In addition, these devices are installed on different floors of several buildings. With long distance between devices, wide network coverage is required. This is another major issue that Netvox has to deal with.

Netvox Solution

Based on the floor plan, Netvox first made an installation proposal including the number and position of the gateways, switches, air purifiers and smart sockets in advance. After installation, our engineers double checked the Zigbee signal strength and LQI (Link Quality Indicator) using Netvox Zigbee Signal Strength Meter Z716S and Netvox IoT Device Management Platform and adjusted the position or number of smart sockets accordingly to ensure continued network health.

In this multi-network system, the power consumption data and status report collected by the smart sockets are sent to the gateways, which are linked together with switches, and eventually integrated and processed on the cloud server. In the end, 650 air purifiers are successfully connected via Zigbee smart sockets, and every device works smoothly without any glitch. Please find below the details:

device status	operating history list	alarm history list	network communication quality list	monitor log list	message/mail setting
device statistics :online 156 offline 6					derived device list>>
device status	name of device	IEEE&EP for device	date of software	device properties report	
●	11332010	00137A000003475E -01	20160714	Router	>>
●	11312025	00137A000003474A -01	20160714	Router	>>
●	11232030	00137A000003472A -01	20160714	Router	>>
●	11212021	00137A0000034702 -01	20160714	Router	>>
●	11122002	00137A00000346DF -01	20160714	Router	>>
●	11322002	00137A0000034750 -01	20160714	Router	>>
●	11232036	00137A0000034730 -01	20160714	Router	>>
●	11212026	00137A0000034707 -01	20160714	Router	>>
●	11132007	00137A00000346E7 -01	20160714	Router	>>
●	11332019	00137A0000034767 -01	20160714	Router	>>
●	11332002	00137A0000034756 -01	20160714	Router	>>
●	11312007	00137A0000034738 -01	20160714	Router	>>
●	11222004	00137A000003470C -01	20160714	Router	>>
●	11212001	00137A00000346EE -01	20160714	Router	>>
●	11332026	00137A000003476E -01	20160714	Router	>>

Summary of installation

Building A: Zigbee system installed from 2F to 6F

Network#1: 1 gateway on 2F and 153 smart sockets on 2F, 3F and 4F

Network#2: 1 gateway on 5F and 125 smart sockets on 2F, 3F and 4F

The two gateways are linked together with a switch on 2F.

Building B: Zigbee system installed from 1F to 5F

Network#1: 1 gateway on 1F and 161 smart sockets on 1F, 2F and 3F

Network#2: 1 gateway on 4F and 131 smart sockets on 4F and 5F

The two gateways are linked together with a switch on 1F.

Building C: Zigbee system installed on 2F

1 gateway and 14 smart sockets are installed on 2F.

Building D: Zigbee system installed from 2F to 4F

1 gateway on 2F and 65 smart sockets on 2F, 3F and 4F

System Features

Easy Installation

The entire wireless smart building system, which consists of gateways, smart sockets and air purifiers, was installed in one day without damaging the interior design. A wired system will never achieve that!

Remote and timed control

Users can connect to any network in the company and control the air purifiers

plugged into the Zigbee smart sockets from the mobile app without having to run around in the buildings.

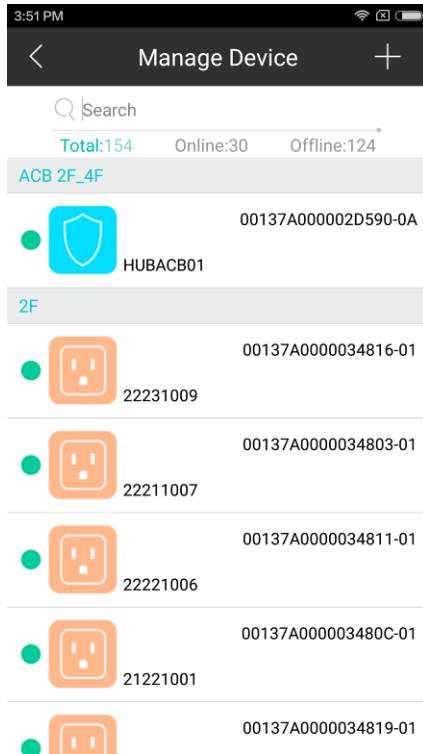
It is possible to set up a schedule for the air purifiers. For example, switch on all air purifiers automatically at 9AM so that all employees can enjoy fresh air upon arrival, and switch off all air purifiers automatically at 5PM to avoid unnecessary waste of energy.



Status monitoring

From the mobile app, users can also monitor the power consumption and on/off status of the air purifiers in different areas and make adjustments accordingly.

It is worth mentioning that the Netvox App shows real-time energy data, which is only available when the appliances plugged into the smart sockets are working properly. It is much more reliable than other manufacturer's apps that only show the on/off status of the socket and cannot reflect the actual state if the socket is disconnected or if the appliance fails.



Client's Feedback – Excellent Experience!

It has been over a year since Netvox finished the project, and there has never been a lost packet, malfunctioned device or communication issue. The reliable Zigbee smart building system not only brings the client excellent experience but also generates many new business opportunities for Netvox. Please find below photos of the new building automation system installed for the same client and feel free to contact us if you are interested in this reliable IoT Building Automation System:





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