Understand Dusun IoT programmable gateway
Build your own IoT plan and business

Dusun Developer Gateway Technical White Paper

Dusun Programmable Gateways

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Catalog

1 Background

With the development of the Internet of Things industry, more and more industries adopt the Internet of Things technology to solve the pain points of the industry and meet the needs of the industry. IoT Gateway is the core component of the Internet of Things, which plays the role of the bridge between the device and the cloud platform. The gateway determines the security of the whole system of the Internet of things. More and more IoT developers or developers of IoT enterprises are developing IoT gateways, developing applications on the gateway for their own industry, and ensuring that the core technology is in their own hands.

Dusun has launched a Developer Gateway Plan that caters to the developer community and allows them to quickly build their own IoT gateway.

2 What is the Developer Gateway

Developer gateway is mainly used by IoT developers to quickly develop gateway hardware products. It has hardware openness and software open source. Gateway developers can do on-board development, system-driven development, and application layer development on the gateway to meet the needs of different types of developers. And the developer gateway adopts a modular design, with flexible assembly characteristics； similar to the assembly of computers, developers choose their own configuration and requirements, developers and manufacturers can quickly assemble the finished gateway.

3 Challenges for developers of IoT solutions

Challenge	Description	Solution
Choice of Hardware platform	Developers need suitable hardware platforms to meet different requirements, processing capabilities, interfaces, and runnable systems, which pose challenges for gateway developers.	Build multi-dimensional, rich hardware platforms, MIPS, ARM, X86, NPU
Development environment	Developers relative to their own familiar development environment, will speed up development, often hardware manufacturers do a system adaptation, which will increase the difficulty and time of development.	Hardware platform for a variety of systems, Windows，linux, openwrt, Debian, Buildroot, Android etc.

Development of wireless protocol	Protocol is the basis of gateway, gateway needs many built-in protocol stacks, and the migration of protocol stacks will be a challenge for developers	Preset wireless chip procedures, and do a good job of protocol stack and system adaptation
Third party software	Gateway application development involves the transplantation and adaptation of third-party software, which needs to be pre-adapted by gateway hardware manufacturers, which is a big challenge for hardware manufacturers.	Hardware manufacturers should adapt the third-party software and quickly iterate the SDK of the gateway
Productization	Developers mainly focus on the development of technology. When the software is developed, it will take a long time to productize, which will greatly extend the PoC time and business model feasibility of the IoT solution.	Batch hardware products, and complete the wireless authentication of the product, the installation of software can be mass production

4 Dusun Developer Gateway

Dusun Developer Gateway is mainly aimed at gateway hardware launched by developers. For different industries and different scenarios, different gateway processing chips are used, the main frequency is from 580MHz to 2GHz, the chip architecture is MIPS, ARM, X86, and the working environment level is from consumer to industrial to vehicle level. Computing power from 0.6Tops to 82Tops. It covers multiple wireless protocols, ZigBee, Z-Wave, Bluetooth, LoRaWAN, Wi-Fi, and supports cellular networking, 4G LTE Cat M1, CAT1, CAT4 standards. The developer gateway also has a wealth of wired interfaces, RS232, RS485, USB, CAN, I/O, etc., to support customer wired application scenarios. At the same time, for different hardware platforms, the system-level SDK is provided to facilitate developers to quickly start from onboard-level development to application software development.

4.1 Dusun IoT Industry Kit Architecture

The hardware architecture of the Dusun Developer Gateway contains the following key features:

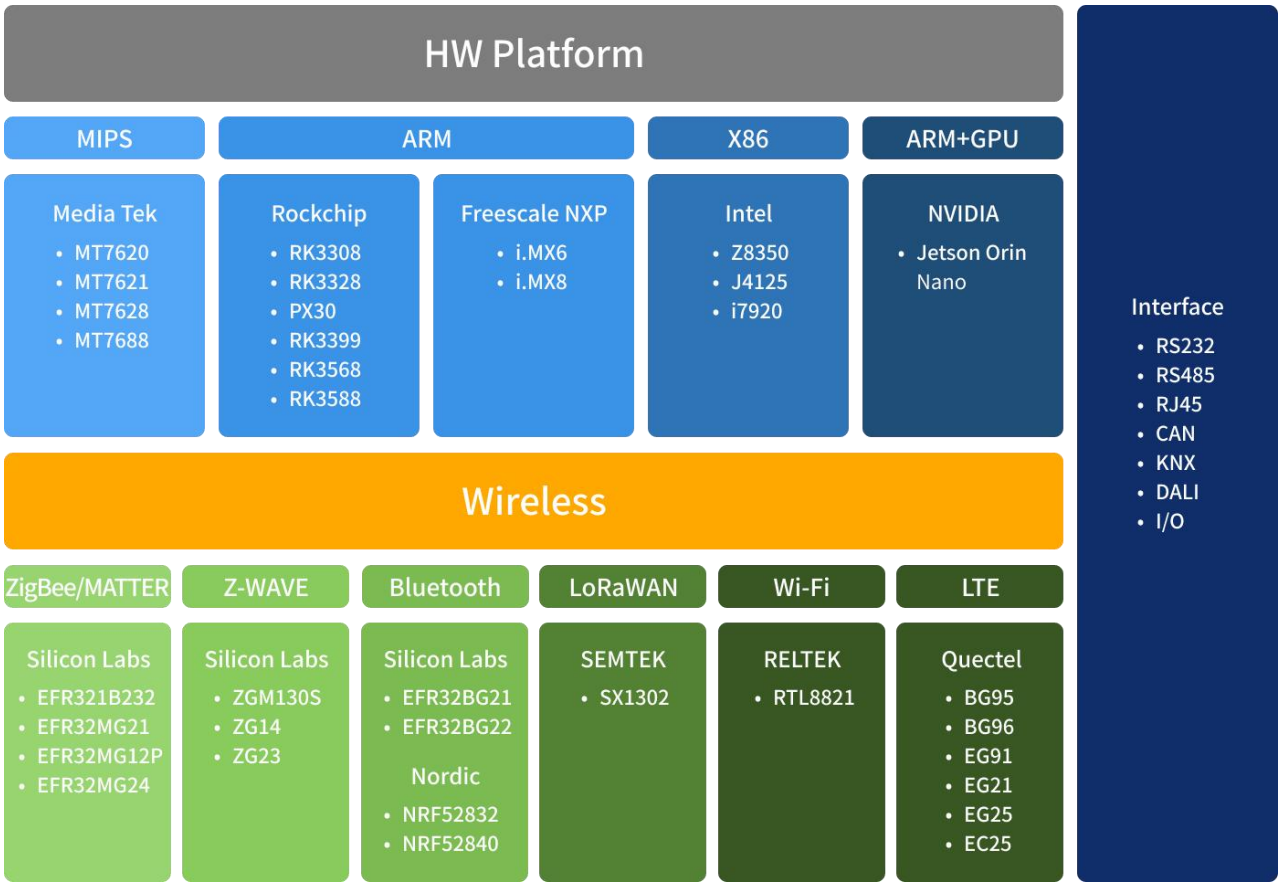
1. Hardware platform performance from low to high, different architecture series of chips MIPS, ARM, X86, ARM+GPU (AI computing power). The working environment level meets the demand of consumer level, industrial level, and vehicle level

2. The abundant hardware interface (RS232, RS485, RJ45, CAN, KNX, DALI, I/O), with a variety

of shapes, with fast hardware iterative upgrade, meet the demand of different interface IoT scenarios

3. Equipped with a variety of wireless protocols, the protocol can be switched flexibly to meet the different needs of developers

4. Equipped with edge computing hardware, from logic processing to AI algorithms, different computing power boards meet different site



4.2 Dusun Developer Gateway – Software Architecture

1. Support multiple open source system SDKS, OpenWRT, Linux, Debian, Buildroot, Android

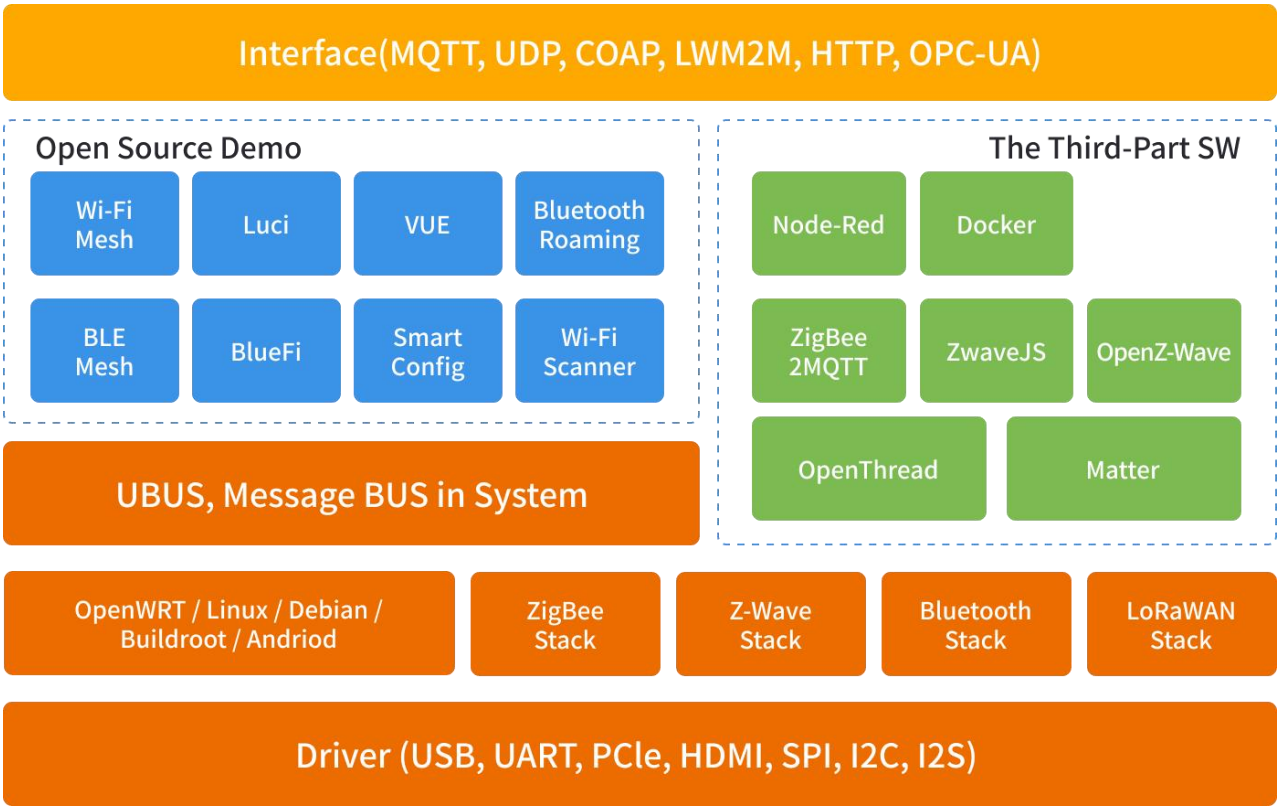
2. Rich system drivers, developers can directly develop application software based on SDK

3. Rich IoT technology development code demo, and open source, developers can use the library provided by Dusun for application development

4. Stable wireless protocol stack, and keep iterative update in real time

5. Integration and adaptation of third-party software, which is ready to use. Node-Red, zwaveJS, OpenZwave, Openthread, Matter

6. Support multiple language development environment, C, C++,Java



4.3 Advantages of Dusun Developer Gateway

1. Modular design, hardware platform core board, wireless chip modularization, splicing design, rapid assembly of developers customized needs

2. Keep the system SDK updated regularly to fix potential problems

3. The developer gateway is productized with complete certifications, covering most countries and regions, and can enter the market immediately

4. Strong FAE team to maintain code-level support

5. Custom gateway, support custom logo; Without too much input, you can enjoy the brand service

5 Dusun Developer Gateway Product

DSGW-210

Dusun Pi3

CPU: RK3328; RAM: Up to 2GB
OS: Ubuntu, Debian, Android
Protocols: Wi-Fi 2.4G/5G, Ble 5.2, Zigbee 3.0, Z-Wave, Lora, LTE, Matter & Thread, GPS, Wireless M-bus/Sub-G

DSGW-210E

Dusun Pi3 Model E Enocean Gateway

CPU: RK3328
RAM: Up to 2GB
OS: Ubuntu, Debian, Android
Optional Wireless: BLE 5.0, Matter, EnOcean, LTE Cat.1/LTE Cat.M1

DSGW-230

IoT Ceiling Edge Computer Gateway

CPU: RK3328 Quad-core CortexA53
RAM: Up to 4GB
OS: Ubuntu Server 20.4
Protocols: Wi-Fi 2.4G/5G, Bluetooth 5.2, Zigbee 3.0, tuya Zigbee, Z-Wave, Lora, LTE Cat.M1

DSGW-200

AoA Positioning Locator

RK3328 Quad-core ARM Cortex-A53
Mali-450MP2 GPU
RAM: Up to 2GB
OS: Debian
Optional Wireless: BLE 5.2, LTE Cat.M1, Wi-Fi 2.4G/5G

DSGW-030

S-Serial Smart Gateway

CPU: MT7688
RAM: Up to 256MB
OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G, Z-Wave, Bluetooth 5.2, Zigbee 3.0

DSGW-040

L-Serial Smart Gateway

CPU: MT7620A
RAM: Up to 128MB; OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G, Z-Wave, Bluetooth 5.2, LTE Cat.M1/ Cat.1, Zigbee 3.0

DSGW-340

Medical Portable Gateway

CPU: EFR32BG24
Flash 256MB; OS: OpenWRT
Uplink: Wi-Fi 2.4G, LTE Cat.1
Downlink: BLE5.2

DSGW-014

Dusun Pi3 Model C LoRaWAN Gateway

CPU: PX30
RAM: Up to 2GB
OS: Ubuntu, Debian, Android
Optional Wireless: Wi-Fi 2.4G/5G, Bluetooth 5.2, LoRaWAN, GPS

DSGW-020

Dual-Band CPE Gateway

CPU: MT7628A
RAM: Up to 128MB; OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G/5G, Zigbee 3.0, Bluetooth 5.2, LTE Cat.M1, LTE Cat.1

DSGW-021

Dual band 4G Cat4 router Gateway

CPU: MT7628AN(600MHz)
RAM: Up to 128MB; OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G/5G, Zigbee 3.0, Z-Wave, BLE 5.2, Sub-G, Matter, LTE Cat.4

DSGW-023

Smart Router Gateway

CPU: MT7621A (Dual-core 880MHZ)
RAM: Up to 512MB; OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G/5G, Zigbee 3.0, Z-Wave, LTE Cat.4, Bluetooth 5.2

DSGW-070

Smart Gateway With Wi-Fi Repeater

CPU: MT7628A
RAM: Up to 128MB
OS: OpenWrt
Optional Wireless: Wi-Fi 2.4G, Z-Wave, Bluetooth 5.0, Zigbee 3.0

DSGW-090

MTK7628 Smart Ceiling LTE Gateway

CPU: MTK7628 (MIPS24KEc (580MHZ))
RAM: 128MB; Flash: 16MB
Uplink: LTE Cat.1/ Ethernet/ Wi-Fi 2.4G
Downlink: BLE5.2 / Zigbee / Z-WAVE / Wi-Fi 2.4G / Thread

DSGW-091

Dusun Pi Zero

CPU: RK3308
RAM: Up to 512MB
OS: Ubuntu, Debian, Android
Optional Wireless: Wi-Fi 2.4G/5G, Bluetooth 5.2, Zigbee3.0, Z-Wave, Lora

DSGW-092

ESP32 BLE Gateway

CPU: ESP32
SIM card: Support
Uplink: LTE Cat.M1/Ethernet/Wi-Fi 2.4G
Downlink: BLE 5.2 / Zigbee / Z-WAVE / Wi-Fi 2.4G

DSGW-094

BLE-LTE Gateway

CPU: BLE DSM-05E(nRF52840)
SIM card: e-SIM /micro SIM Optional
Installation method: Flat, Ceiling, DIN
Uplink: LTE Cat.M1/CatNB
Downlink: Bluetooth 5.2

DSGW-081

Industry Edge Computer Gateway

CPU: NXP i.MX6ULL Cortex A7 800MHZ
RAM: Up to 512MB; OS: Linux
Protocols: Bluetooth 5.0, Zigbee3.0, 4G LTE Cat.1, Wi-Fi, Modbus, CAN, I/O Interface, KNX

DSGW-089

i.MX8m Lift IIOT Gateway

CPU: NXP i.MX8M mini Quad-cores Cortex-A53 and Arm® Cortex-M4F
Uplink: 4G LTE Cat.4 / Ethernet / Wi-Fi 2.4G/5G
Downlink: Bluetooth 5.2

CDGW-006

CDGW-006 DTU Gateway

CPU: MT7628
RAM: Up to 512MB OS: OpenWRT
Protocols: Wi-Fi, LTE CAT1 EC200N-CN, LTE CAT4 EG25-G, LTE CAT4 EC25-EUX, LTE CAT4 EC25-AFX

Edge Computing Gateway

DSGW-290

Dusun Pi4 IoT gateway

RK3568 Quad-core Cortex-A55
RAM: Up to 8GB Storage: Up to 128G
OS: Linux, Debian, Android, Ubantu
Protocols: Wi-Fi 2.4G/5G, Z-WAVE, Zigbee3.0, LoRaWAN, GPS, Sig Mesh, Sub-G and Matter

DSGW-380

Industry AI Edge Computer Gateway

CPU: Rk3588 quad-core Cortex-A76 and quad-core Cortex-A55
Uplink: 4G LTE Cat.4 & Cat.1 / Ethernet / Wi-Fi 2.4G/5G
Downlink: Bluetooth 5.2 / LoRaWan

DSGW-081

Industry Edge Computer Gateway

CPU: NXP i.MX6ULL Cortex A7 800MHZ
RAM: Up to 512MB; OS: Linux
Protocols: Bluetooth 5.0, Zigbee3.0, 4G LTE Cat.1, Wi-Fi, Modbus, CAN, I/O Interface, KNX

DSGW-089

i.MX8m Lift IIOT Gateway

CPU: NXP i.MX8M mini Quad-cores Cortex-A53 and Arm® Cortex-M4F
Uplink: 4G LTE Cat.4 / Ethernet / Wi-Fi 2.4G/5G
Downlink: Bluetooth 5.2

Company Introduction

Based in Hangzhou, China, with clients & partners all over the globe, Zhejiang Dusun Electron LTD. was established in 2005, and has been focusing on the research, development, design and manufacturing of intelligent human-computer interaction technology and wireless transmission technology for a long time. Dusun focus on the supply of kernel hardware in the Internet of Things(IoT). It doesn't matter you're a solution provider, distributor, or IoT developer, Dusun is here to help you create your best IoT project.

Dusun's one-stop AIoT developer products and service system has been well-recognized by domestic and foreign developer groups. Focusing on IoT and industrial customers, Dusun IoT developers plan to provide a concept of open cooperation, commit to the vision of making everything more intelligent, and provide competitive products, technologies, solutions and services to universities, industry users, system integrators and operators. Dusun's complete gateway product series has served more than 10000 developers worldwide and more than 1500 customers/partners.

Our Mission

To make the IoT wireless network equipment no longer difficult to connect and interact with

Our Vision

To become the Top 10 human-computer inter-action equipment and IoT network equipment provider

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Dusun IoT / Dusun Remotes

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