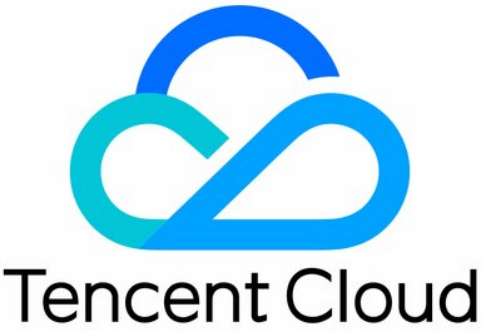
IoT Explorer

Product Introduction



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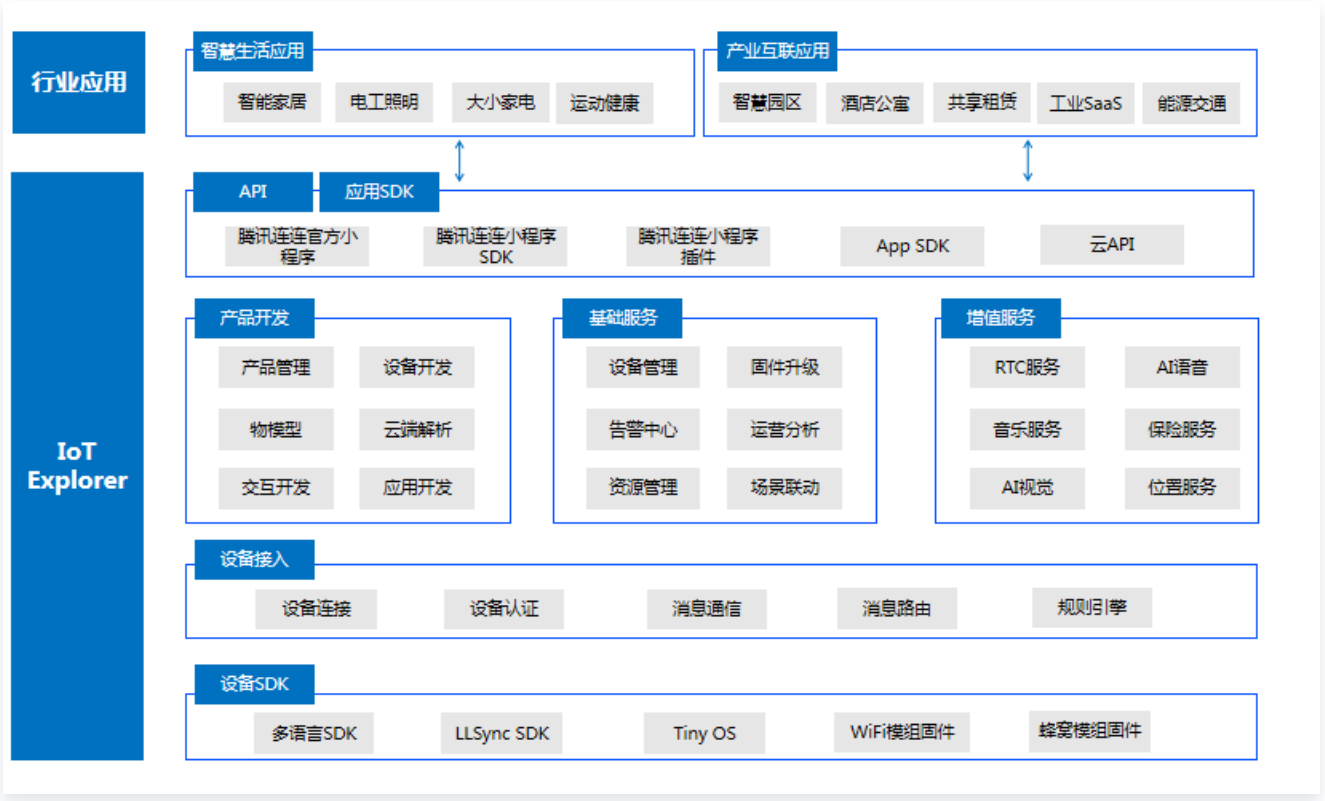
Overview

Tencent Cloud IoT Explorer is an IoT PaaS platform oriented towards Smart Life and Industrial Internet Applications. It provides one-stop intelligent device services for device manufacturers, solution providers, and app vendors in various industries based on the Internet of Things. The platform offers mass device connection and management capabilities, as well as mini program application development capabilities based on Tencent Lianlian. It connects Tencent Cloud Basic Products and AI capabilities, and aggregates Tencent Ecosystem Content Capability. This improves the efficiency of device intelligence in traditional industries and reduces users' development and Ops costs.
You can watch the following video to learn about the product overview and strengths of Tencent Cloud IoT Explorer:
Watch video

Product Architecture

The product architecture of the IoT development platform is as shown below:



Device SDK

Device SDK provides users with multi-language SDK and module firmware capabilities, facilitating quick integration of devices and SDK access to Tencent Cloud.

- Provide C SDK, Android SDK, Java SDK, FreeRtos SDK.
- Provide integration at the level of Tencent Tiny OS and RT-Thread OS.
- Provide LLSync SDK to meet device connectivity for Bluetooth devices.
- Provide various Wi-Fi module firmware and cellular module firmware, making it easy for equipment to access the cloud via the AT Command Protocol.

Device Connectivity

Device connectivity provides devices with device identity authentication, connection management, massive message communication transmission, and rule engine capabilities, meeting the needs of devices with various communication standards such as Wi-Fi, cellular, LoRaWan, and Bluetooth to connect to the cloud.

- Support MQTT, CoAP, and HTTPS protocol access.
- Support massive devices access and message transmission.
- Support direct-access, gateway and sub-device access.
- Support identity verification in symmetric and asymmetric methods.

Product Development

Provides users with one-stop product development services to meet the development efficiency of device to cloud in Smart Life and industrial interconnection scenarios. Users can quickly integrate devices into the platform by defining products, managing thing models, developing devices, and debugging devices. For applications in the Smart Life domain, users can select the official Tencent Lianlian mini program or OEM mini program, App, and quickly complete application-side development through interactive development to define exclusive networking interaction, alarm rules, and device control panel development capabilities.

Basic Service

Basic services provide users with service functions such as device management needed after the device intelligence development phase, enhancing users' operational efficiency and reducing maintenance costs. This includes service features such as firmware upgrade, equipment management, alarm center, and operational analysis.

Value-Added Service

Value-added services aggregate the advantageous products within Tencent and the capabilities of the content ecosystem to meet the diverse needs of IoT devices in various

scenarios.

- RTC service meets the audio and video communication capabilities between smart devices and mini programs.
- AI Vision meets the identification capabilities of smart devices for human faces and the management capability of the human face resource library across devices.
- Location service satisfies functions such as GPS positioning, Wi-Fi positioning, cellular positioning, geofencing, and historical trajectory query for IoT applications.
- Insurance services meet users' insurance services based on the Internet of Things, such as electrical fire insurance, two-wheeled vehicle comprehensive insurance services.

API and Application SDK

The IoT development platform, through the open capabilities of Tencent Lianlian's official mini program, Tencent Lianlian mini program SDK, and App SDK, assists in the rapid intelligentization of devices in the smart life domain, such as smart homes, electrical lighting, home appliances, and sports and health equipment. Meanwhile, industrial internet applications like smart parks, smart hotel apartments, leasing services, industrial internet applications, smart energy, and transportation can quickly integrate, manage, and control devices based on APIs. This makes it easy for industrial internet applications to focus on core business and quickly complete project implementation.

Advantages

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Mature and Stable Architecture

Based on Tencent's years of massive connectivity and message processing capabilities, IoT Explorer has been verified by large-scale IoT applications in the industry. It has the capability to support the access of hundreds of millions of devices and tens of millions of concurrent messages. The architecture is elastically scalable and highly available, with a service SLA of 99.95%, fully guaranteeing the stable operation of users' businesses in industrial and consumer IoT scenarios.

Low-Cost Managed

IoT Explorer provides one-stop platform tools and services, reducing the development difficulty for users in device connectivity and application access. It also provides end-to-end IoT PaaS managed services, which can reduce the cloud resources and operational workforce costs invested by users at the IoT platform level, allowing users to focus on their core business.

Low-Threshold Device Connectivity

IoT Explorer provides the access capability of standard protocols such as MQTT, HTTPS, WebSocket, CoAP, etc. It supports various access methods including direct connection, gateway and subdevice, and generalization. It supports the access of multiple communication standards such as cellular, Wi-Fi, LoRa, Bluetooth, etc., and provides multilingual access SDKs and adapted communication modules. Devices in various scenarios can be accessed with low threshold.

One-Stop Mini Program Development Capacity

Tencent Lianlian's official mini program and SDK are provided by IoT Explorer. Without user attention to the underlying implementation, users can quickly build application endpoint capabilities in consumer IoT scenarios such as whole-house intelligence, smart door locks, IPC cameras, and trtc, greatly improving Application Development Efficiency and building a differentiated C-end user experience for users.

Seamless Integration, Efficiency and Convenience

IoT Explorer provides end-to-end device management capabilities, open TencentCloud API services, multilingual TencentCloud API SDKs, and stable and efficient rule engine message forwarding capabilities. It can fully decouple the interaction between northbound applications

and southbound devices, enabling users to complete the integration of business systems and physical devices efficiently and quickly, and easily manage massive devices through IoT Explorer.

Use Cases

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The IoT Explorer application scenarios are mainly oriented towards various IoT-based solutions in the fields of consumer IoT and industrial IoT. The platform provides multi-protocol device connectivity, high-reliability device connection, massive message communication capability, and convenient device management capability to meet the various industrial IoT application needs of industries such as transportation, travel, energy, medical care, industry, retail, and Internet. The platform also provides an all-in-one device connectivity for consumer IoT scenarios and the official mini program Tencent Lianlian. Through the open capabilities of the Tencent Lianlian mini program, it meets the intelligent and whole-house intelligent application needs of various consumer electronic products such as Wi-Fi and Bluetooth.

Consumer IoT

Whole House Intelligence

Supports whole-house intelligent scenario services in industries such as real estate, hotels, and apartments. Tencent Lianlian provides users with a consistent cross-platform and cross-device experience. It supports convenient interactions such as WeChat Scan + NFC Tap, one-click convenient sharing based on the WeChat relationship chain, visible intercom with direct connection between hardware devices and WeChat, and exclusive scenario privileges such as strong reminder notifications from WeChat. Tencent Lianlian provides the capability of standard gateway subdevice SDK protocol Inside. Based on the standard SDK integration, it has the capabilities of wired PLC + wireless BLE MESH, enabling whole-house offline controllability. Based on the linkage capabilities of all Lianlian scenarios, it constructs an immersive spatial experience, with a second-level latency experience in the execution of more than 10-device scenarios. The Tencent Lianlian mini program has built-in scenario-based music playlists, which are connected with KuGou and QQ Music, providing abundant content resources.

Smart Door Lock

Support the rapid intelligentization of traditional locks, and provide one-stop access to smart locks and visible doorbells as well as WeChat mini program development capability. The platform also provides capabilities such as strong WeChat message notifications, doorbell call WeChat reminders, and visible intercom for scenarios such as lock calling and security. The official mini program of the platform, Tencent Lianlian, provides a development-free lock panel to help users create a high-quality smart lock experience based on WeChat mini programs.

Smart Security

Support the quick integration of security devices such as network cameras (IPC), Network Video Recorders (NVR), electronic cat eyes, pet feeders, gas detectors, and fire alarms into the platform, thereby achieving video transmission, cloud storage, remote viewing, real-time message alarms and other features at a lower cost. And it can provide abundant AI algorithm models to meet the intelligent application needs in scenarios such as intelligent security monitoring and commercial passenger flow statistics.

Intelligent Education

Provide quick integration services for platforms that support various intelligent education devices in education scenarios, and provide mini programs and APP SDKs to facilitate users' quick integration and application, meeting business needs such as unified management of intelligent education devices and control of devices by parent-end applications.

Intelligent Wearable

Support the integration of wearable devices, such as anti-lost devices, TWS headphones, sports watches, healthcare wearable devices, children's watches, law enforcement recorders, electronic ID cards and other wearable devices. Provide users with differentiated WeChat mini program capabilities to help users quickly integrate Bluetooth devices, achieve high-quality two-way audio and video calls, remote monitoring, and video cloud storage, thereby meeting the needs of real-time communication and daily recording in wearable scenarios.

Smart Home Appliances

Support quick integration of various types of home appliances, such as remote control gateways, environmental appliances, kitchen appliances, personal care health appliances, etc. Users can integrate with the platform based on the device-side SDK provided by the platform or Tencent Lianlian ecological modules, as well as use the official Tencent Lianlian mini program or Tencent Lianlian mini program SDK to quickly create their own Chinese domestic brand mini programs, thereby reducing the development and operation costs of users' home appliance intelligence.

Industrial IoT

Internet of Vehicles

Support mass connection and real-time message communication business scenarios for various vehicles, such as autonomous driving, logistics freight vehicle management, pre-installed TBox or vehicle-mounted terminals, aftermarket OBD vehicle connectivity and other scenarios. The platform provides mass connection and high-concurrency message

communication capabilities to meet the instantaneous high-concurrency throughput requirements of vehicles in various scenarios. Users can easily collect vehicle data through IoT Explorer and use the platform to control and manage vehicles. Users do not need to invest resources in the development and maintenance of the IoT development platform, thereby being able to focus more on their own business.

Sharing Lease

The platform provides highly reliable device connections and low-latency message communication services for sharing economy platforms such as shared charging piles, Power Banks, self-service retail, shared self-service car washing, and shared coffee machines. User only needs to focus on the development, Ops, business operation, and promotion of the business platform. Tencent Cloud IoT Explorer can lower users' development and operational investment costs and fully guarantee the stable operation of users' sharing business platforms.

Intelligent Broadcast

Support the intelligentization of speakers and broadcasting equipment in the financial industry, aggregated payment, and emergency scenarios, such as receipt speakers, cloud broadcasting, and intelligent broadcasting of POS devices. The platform provides highly reliable connection and communication capabilities as well as QoS service guarantee capabilities in poor network conditions to ensure the reliability of message transmission. The platform provides a unified device-side SDK to solve the problems of repeated and missed broadcasts, and provides firmware upgrades, real-time distribution of application-side file resources, Tencent Real-Time Communication (TRTC), and other capabilities to create a high-quality intelligent broadcasting experience for users.

Intelligent Ordering

Support restaurants, self-operated takeaway, and third-party takeaway ordering services in the catering industry to decouple the store's catering POS from the catering business middleware through the IoT development platform. Through the bidirectional MQTT message communication capability provided by the IoT development platform, orders can be quickly and transmitted to the store in real-time. Based on the MQTT QoS service quality assurance mechanism, it can effectively support the reliability of message communication in weak network conditions, ensuring the normal operation of the restaurant during peak business hours. Through the IoT development platform, the IT architecture of catering enterprises can be optimized, enabling them to manage their store ordering services more efficiently.

Asset Management

Provide IoT platform services for remote asset management across various industries. Equipment asset management usually involves cellular devices. Users need to obtain device status and data in real time, and perform remote firmware upgrades and management on devices. It includes construction machinery, medical equipment, agricultural machinery, industrial manufacturing, and other equipment that requires remote management, such as environmental sensors, industrial robots, heat pumps, injection molding machines, motors, etc. The platform provides reliable connections, message communication capabilities, firmware upgrade capabilities, and open TencentCloud APIs to meet the platform support requirements under various equipment asset management scenarios across various industries, enhance users' asset management efficiency, and reduce after-sales operational costs.

Smart Apartment

Support intelligent management of various types of long-term rental apartments, park dormitories, and apartment buildings, and provide connectivity and management for various water, electricity, gas, locks, and access control devices within the apartments. Through the one-stop device development service provided by the IoT development platform, the on-cloud process of apartment devices can be accelerated. Meanwhile, the business management system of the apartment can conveniently and securely manage and control devices through the platform's open APIs. The platform also provides Tencent real-time communication (TRTC) service to meet the business needs of smart apartment users in audio and video scenarios, thereby reducing the R&D and operations costs of users. Users only need to focus on the core business of the apartment.

Product Limitations

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Device Connectivity

Limit Category & Description		Limit Parameter
Product quantity	The maximum number of products that can be created under one account.	2000
Device quantity	The maximum number of devices that can be created for one product.	1000000
Gateway and subdevice	The maximum number of subdevices that can be added under one gateway.	1500
Thing Model	The total number of feature definitions in a product's Thing Model.	100
data storage time	Device property, event and behavior data retention period.	The data retention period for device properties, events, and behavior data is 3 days.
Resource Management	The maximum total size of resource files that can be stored by an account on the Internet of Things Platform server.	1GB
	The maximum number of files that can be stored by one device.	1000
OTA upgrade	File size limit for an upgrade package.	1024M
	The maximum number of devices that can be upgraded in a single batch upgrade.	10000

Message Communication

Limit Category & Description		Limit Parameter
Device Connection Restrictions	Use the same device certificate information to can be established a	Yes

	connection with the platform server at the same time.	
Number of connections	The maximum number of MQTT connection requests per second for a device.	1 time / 5 s
Number of device subscriptions	The maximum number of subscriptions for a device.	No limit.
Request quantity	The number of requests sent from the device side to the Internet of Things Platform by an account per second.	Not limited for now.
	The number of requests sent from the Internet of Things Platform to the device side by an account per second.	Not limited for now.
Message communication throttling	The maximum message count a device can report per second.	30
	The maximum limit of messages per second a device can receive downstream (subject to the network environment)	50
Bandwidth	The maximum throughput (bandwidth) limit of a connection per second.	No restrictions for now.
Cache Request Count	The Internet of Things Platform limits the maximum number of unconfirmed inbound publish requests for each client.	150
Message storage duration	Maximum storage time of QoS1 messages.	24h
MQTT message length	Maximum length of an individual MQTT publish message. Publish requests exceeding this size will be directly denied.	16KB
CoAP message length	Maximum length of an individual CoAP publish message. Publish requests	1KB

	exceeding this size will be directly denied.	
MQTT Keep Alive	MQTT connection heartbeat time. If the heartbeat time is not within the interval, the server will reject the connection.	900s
RRPC Timeout	Request timeout for devices to respond to RRPC requests.	10s
Offline message	Offline message count.	Up to 150 messages per device.
	Offline message storage duration.	Messages can be stored for up to 24 hours.
KeepAlive duration	Permissible range of KeepAlive duration.	0–900s

Topic

Limit Category & Description		Limit Parameter
Number of custom Topic types	A product can define a maximum number of Topic types.	100
Topic length	Length limit of Topic.	255 bytes, UTF-8 encoded characters.
Topic category	The maximum number of hierarchical categories that a Topic can contain, that is, the maximum number of slashes in a Topic.	10
Subscription Count	The maximum number of subscriptions for each subscription request.	1
Operation Effective Time	Subscription and unsubscription both have operation effective times.	5s
Broadcast Topic	Message body limitation for messages to be broadcast.	8KB. Convert the original message into binary data and perform Base64 encoding, thus generating the message body.

	The server-side SDK broadcasts all messages every minute.	A single product can only execute one task at the same time.

Rule Engine

Restriction Type & Description		Limit Parameter
Number of rules	The maximum number of rules that can be set for one account.	100
Target number of circulation	Operand for forwarding data in one rule.	10
Rule engine message processing volume	Data forwarding is the data processing capability provided to an account.	None
Write message volume	In the current situation where the performance of the target cloud product instance is sufficient, data forwarding provides the data forwarding capability for an account.	None
Target requirement for circulation	Data forwarding depends on the target product. Ensure that the target product instance is normal. Abnormal conditions such as instance down, arrears, parameter error, and configuration error of the target product will lead to message flow failure.	The instance needs to be normal.
Message Deduplication	During data flow, to ensure message delivery, the same message may be sent repeatedly until the client returns ACK or the message expires.	No. The unique ID in sending messages is freely implemented.

Application Development

Limit Category & Description	Limit Parameter

Number of OEM applications	The maximum number of applications that can be created under one project. Applications include mini program applications and App applications.	20
Number of registered application users	The maximum number of users allowed to register for an OEM application.	No limit
Number of devices bound by a user	Total number of devices that can be bound by a user.	1200
Number of households created by users	The number of households that the user under one application is allowed to create.	20
Number of scenarios created by users	The number of scenarios that a user is allowed to create.	No limit
Number of device scheduled tasks	The number of scheduled tasks that a user is allowed to create.	120