# Alibaba Cloud MQTT

## Product Introduction

Issue: 20190526

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# Generic conventions

Table -1: Style conventions

| Style | Description | Example |
| --- | --- | --- |
|  | This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results. |  Danger:<br>Resetting will result in the loss of user configuration data. |
|  | This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results. |  Warning:<br>Restarting will cause business interruption. About 10 minutes are required to restore business. |
|  | This indicates warning information, supplementary instructions, and other content that the user must understand. |  Notice:<br>Take the necessary precautions to save exported data containing sensitive information. |
| | This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user. |  Note:<br>You can use Ctrl + A to select all files. |
| > | Multi-level menu cascade. | Settings > Network > Set network type |
| Bold | It is used for buttons, menus , page names, and other UI elements. | Click OK. |
| `Courier font` | It is used for commands. | Run the `cd / d C :/ windows` command to enter the Windows system folder. |
| *Italics* | It is used for parameters and variables. | `bae log list --instanceid` *Instance_ID* |
| [] or [a\|b] | It indicates that it is a optional value, and only one item can be selected. | `ipconfig` *[-all\|-t]* |

| Style | Description | Example |
| --- | --- | --- |
| {} or {a\|b} | It indicates that it is a required value, and only one item can be selected. | `swich {stand \| slave}` |

# Contents

# 1 What is AliwareMQ for IoT?

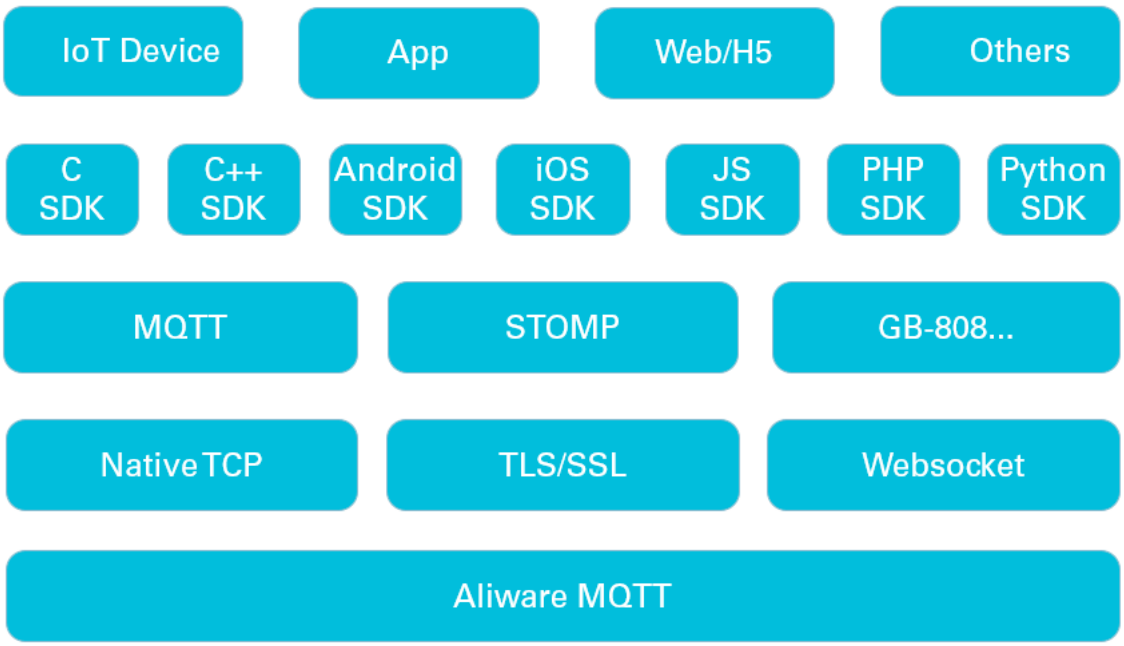
This topic describes the architecture, scenarios, and benefits of AliwareMQ for IoT. While most traditional message queue (MQ) services are used among microservices, AliwareMQ for IoT implements message transmission between clients and clouds to make the interconnection of everything a reality.

For information about how to use AliwareMQ for IoT, see *Quick start guide*.

## Architecture

AliwareMQ for IoT is a lightweight message-oriented middleware (MOM) launched by Alibaba Cloud for mobile Internet and IoT scenarios. Based on the features of message transmission in mobile Internet and IoT scenarios, it supports MQTT, STOMP, China National GB-808 Standards, China New Energy Vehicle National Standards, and other mainstream communication protocols. In addition, AliwareMQ for IoT supports native TCP persistent connections, SSL encryption, WebSocket, and other transmission modes at the data link layer and supports mainstream development languages and platforms including C/C++, Java, iOS, and Android. The technology stack of the system is shown in *Architecture*:

Figure 1-1: Architecture

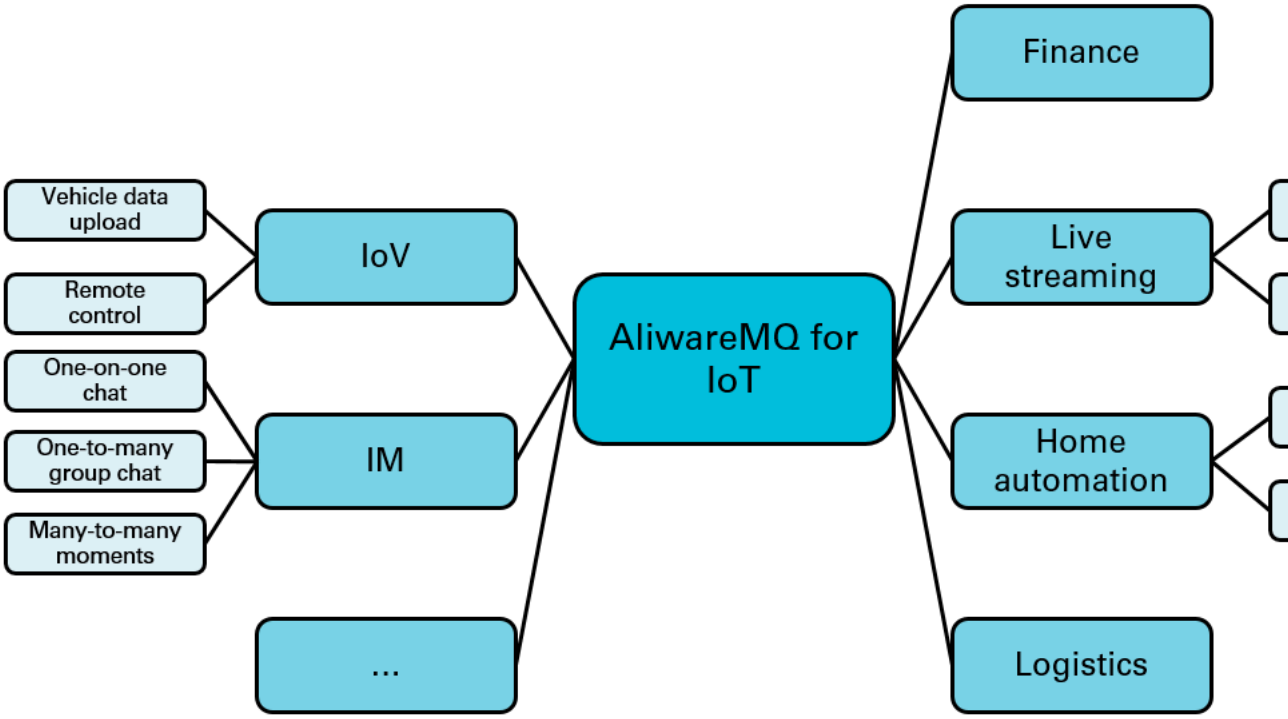


## Scenarios

With multi-protocol, multi-language, and multi-platform support capabilities, AliwareMQ for IoT is widely used in mobile Internet and IoT scenarios, including mobile live broadcasting, Internet of vehicles, financial payments, smart catering, instant chatting, and other scenarios.

*Figure 1-2: Scenarios* shows the main scenarios of AliwareMQ for IoT.

Figure 1-2: Scenarios

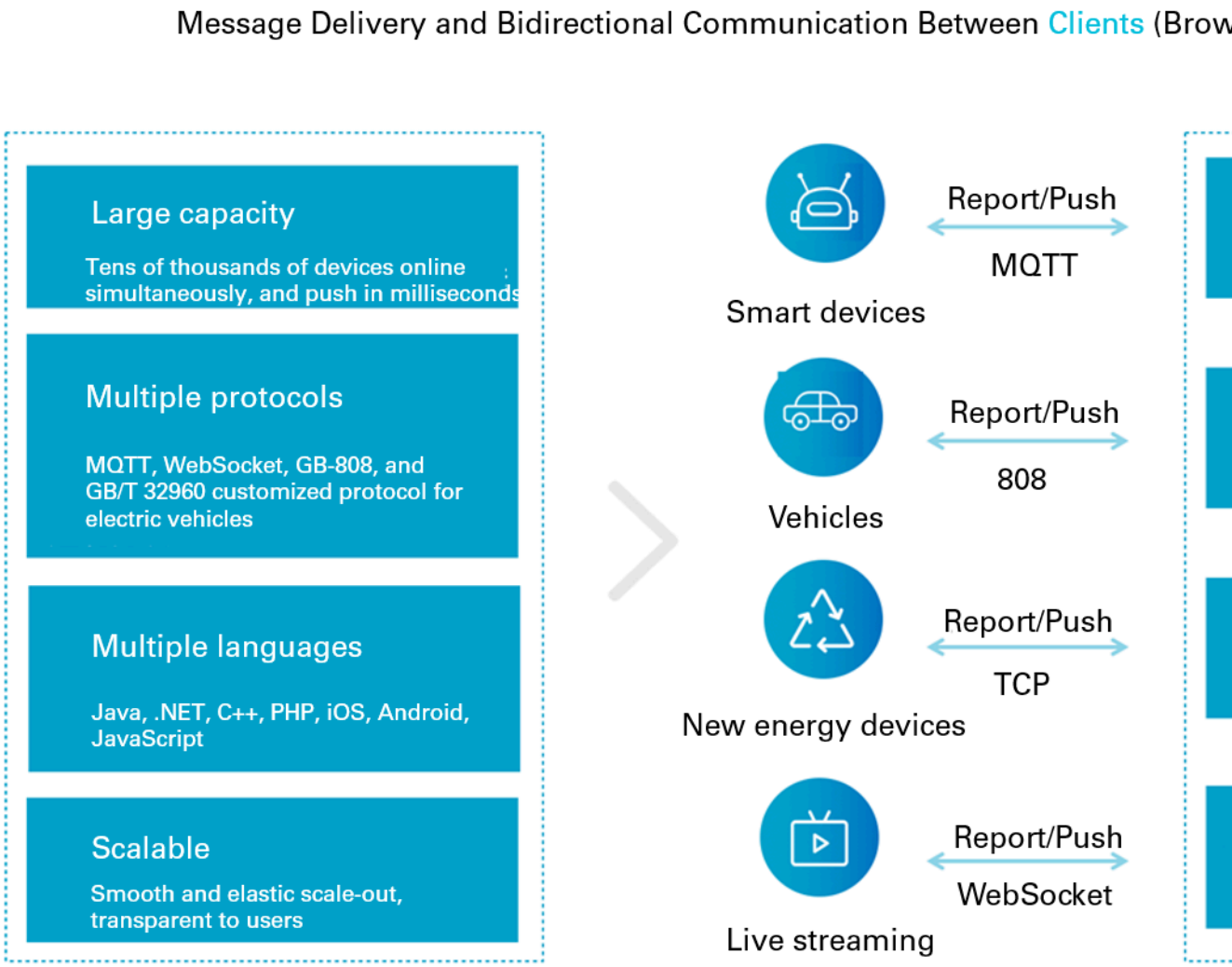



## Benefits

AliwareMQ for IoT mainly provides mobile connection access, connection management, and data forwarding services. Used with other Alibaba Cloud MQ products that support backend data persistence and message storage, such as traditional MOM (RocketMQ and Kafka), AliwareMQ for IoT can serve as a connection gateway with unlimited scalability. AliwareMQ for IoT is designed with a distributed architecture. With no single point of failure (SPOF) and infinite scalability between components, its architecture ensures that its capacity is completely transparent to you and can be adjusted according to your online usage.

*Figure 1-3: Benefits* shows the benefits of AliwareMQ for IoT.

Figure 1-3: Benefits




Compared with other mobile messaging services, AliwareMQ for IoT has the following benefits:

- It supports standard protocols, such as MQTT, STOMP, and China National GB-808 Standards. Therefore, you are not bound to any technologies and can migrate the MQ service seamlessly to the cloud by using most open source SDKs.
- As a persistent connection gateway responding to massive mobile clients, its backend can communicate with other Alibaba Cloud MQ products. You can achieve bidirectional communication between the client and the cloud without building individual gateways.

- **It supports device-level permission control and SSL/TLS-encrypted communicat ion, making data transmission more secure and reliable.**

# 2 Terms

This topic introduces some basic terms of AliwareMQ for IoT and the main concepts and terms involved in the MQTT protocol. For the basic concepts and scenarios of AliwareMQ for IoT access, see *What is AliwareMQ for IoT?*.

Instance

A created and purchased entity unit of the AliwareMQ for IoT service. Each MQTT instance (short for AliwareMQ for IoT instance) has a globally unique endpoint URL. Before using AliwareMQ for IoT, you must create an instance in the corresponding region and access the service through the mapping endpoint. For information about how to create an MQTT instance, see *Quick start guide*.

Parent topic

MQTT is a messaging protocol that is based on the publish-subscribe model. Therefore, each message belongs to a topic. MQTT supports multiple levels of topics . A level-1 topic is a parent topic. Before using AliwareMQ for IoT, you must create a parent topic in the AliwareMQ for IoT console or RocketMQ console.

Subtopic

A level-2 or level-3 topic is a subtopic of a parent topic in MQTT. You can directly set subtopics in the code without the need to create them in the console. Note that the total length of a parent topic and its subtopics cannot exceed 64 characters in AliwareMQ for IoT. If the length limit is exceeded, a client exception occurs.

Client ID

An identifier of an MQTT client (short for AliwareMQ for IoT client), which must be globally unique. If two MQTT clients with the same ID try to connect to AliwareMQ for IoT, the request is denied.

A client ID consists of two parts in the format of `<GroupID>@@@<DeviceID>`. A client ID can contain up to 64 characters and must not contain invisible characters. For more information, see *#unique_7*.

- Group ID: An identifier that specifies the name of a group of nodes with identical logic and functions, representing a category of devices with the same functions. To

use a group ID, you must first create it in the RocketMQ console. For information about how to create a group ID, see *Quick start guide*.

- Device ID: A unique identifier of a device, which is specified by the user. The device ID must be globally unique, for example, the serial number of a sensor.

### Network type

#### Endpoint URL

We recommend that mobile devices use Internet endpoints to access AliwareMQ for IoT. AliwareMQ for IoT also supports access through intranet endpoints. Currently, AliwareMQ for IoT supports access from port 1883 of standard protocols. In addition, it supports SSL Encryption, WebSocket, and Flash. The endpoint URL is automatically allocated after the instance is created. Please properly keep the endpoint in case of any loss. For information about how to create an MQTT instance, see *Quick start guide*.

### MQTT-related terms

#### QoS

Quality of service (QoS) refers to the message transmission service quality. It includes three levels, including 0 (at most once), 1 (at least once), and 2 (exactly once).

#### cleanSession

A flag in MQTT that specifies whether the client is concerned about the previous status after the TCP connection is established. The syntax is as follows:

- cleanSession=true: When an offline client goes online again, it does not deal with any previous subscription relationships or offline messages.
- cleanSession=false: When an offline client goes online again, it must process the offline messages. The previous subscription relationship remains effective.

Note:

- MQTT requires that cleanSession of each client must be fixed during connection and cannot be dynamically changed. Otherwise, the offline messages may be determined incorrectly.
- The external messages of MQTT that require QoS2 do not currently support non-cleanSession flags. If the client subscribes to messages that require QoS2, the subscription relationship does not take effect even if the value of cleanSession is set to false.

- cleanSession of the point-to-point (P2P) messages is determined by the configurat ion of the sender's client.

The following table describes the results of different combinations of QoS and cleanSession:

Table 2-1: Different combinations of QoS and cleanSession

| QoS level | cleanSession=true | cleanSession=false |
| --- | --- | --- |
| 0 | No offline messages are processed, and the online messages are only pushed once. | No offline messages are processed, and the online messages are only pushed once. |
| 1 | No offline messages are processed, and the online messages are guaranteed to be reached. | Offline messages are processed, and all messages are guaranteed to be reached. |
| 2 | No offline messages are processed, and the online messages are guaranteed to be pushed only once. | Not supported |