

Communication Protocol for Cloud Printer Connecting to Third-party MQTT Server

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1. Instruction

The document defines the communication protocol for cloud printing devices to connect to third-party MQTT servers.

Supports connecting to two standard types of servers: Ali baba Cloud MQTT, and self built MQTT.

If there is a customization requirement, please contact the business personnel.

2. MQTT Topic agreement

Subscription topics are used to receive printing tasks and voice broadcast messages: qos = 1.

Publish topics applied to the printer status and print results upload: qos = 1.

3. Print and voice message data format

Messages pushed by MQTT to the cloud printer organize the data in JSON format, and the character encoding is in UTF-8 format. Each field information is described in the following table:

Keywords	Type	Instruction	Yes/No
id	Uint32	Print job id. The server must not duplicate it to prevent duplicate printing. Remarks: Cloud printing devices upload printing results and identify corresponding tasks with ID.	Yes
type	int	Print data layout type:	Yes

		1: ESC (BASE64 coded data) 2: CPCL 3: TSPL 4: XML format (UTF-8 code (XML format is defined on the webs (https://www.sw-aiot.com/doc) definition of printer layout) 5: JSON format (UTF-8 code) (Please check webs JSON layout definition) 6: PNG Image (image download url or BASE64 coded data)	
contents	String or JSON date		Yes
pWidth	int	Paper Width: 58mm, 80mm、110mm ... System default Width 58mm	No
pCopy	int	Number of Copies to Print, default 1	No
pType	int	Print type: 1. Thermal continuous paper 2. Label paper 3. Black- label paper	No

		4. Perforated paper	
vType	int	type -1: No Vtype 0: Customized voice 1: You have a new order, please handle it on time	No
vMessage	string	vMessage Type (Synthetic by the TTS, UTF-8 code) vType showed 0 is valid	No
message	string	Reserve http download type of print content, and contents two options, first choice contents	No

Example of printing and voice broadcasting messages for MQTT push cloud printer subscription:

Example of XML printing layout:

```
{
  "id": "123456",
  "type": "4",
  "pType": "1",
  "pWidth": "58",
  "pCopy": "1",
  "vType": "0",
  "vMessage": "Audio test",
  "contents": "<CB>Ticket</CB><BR>商户存根<BR>请妥善保管<BR>-----<BR>商户名称 小熊每日鲜水果店<BR>商户编号1005800029<BR>交易时间 2020-12-11 10:23:30<BR>交易订单号1005800012112007217<BR>支付单号"
}
```

202012112200140385141256912
优惠金额 5.00
备注 测试小票
交易状态 收款成功
支付方式 支付宝-公众号支付
交易金额 126.50 元

<QR>10058001200047217</QR>

打印时间 2020-11-12 11:02:36
签名
"}

Example of JSON printing layout:

```
{
  "id":123457,"vType":0,"vMessage":"这是测试语音",
  "pType":1,"pWidth":58,"pCopy":1,"type":5,
  "contents":[
    {
      "cont":"云打印 JSON 排版","type":"title",
      "thead":{
        "名称":"40%","单价":"25%","数量":"15%","金额":"25%",
        "tbody":[
          [
            "云打印机 (4G/WiFi) ",100,1,100],
            [
              "4G 音箱 (摄像头) ",999.44,1,999.44],
            [
              "4G 音箱 (摄像头+显示屏+身份证) ",999.66,1,999.66]]],
        "cont":"合计:2009.1 元","size":"11","align":"left",
        "cont":"联系人:张三","size":"00","align":"left",
        "cont":"配送地址:广东省深圳市宝安区","size":"00","align":"left",
        "cont":"备注:有现货, 量大价优, 欢迎洽谈!","size":"11","align":"left",
        "both_sides":["收款金额","258.00"],
        "both_sides":["支付方式","微信支付"]
      }
    }
  ]
}
```

```

{"cont":"1234567890","type":"qrcode","align":"center","size":"60"},
{"cont":"1","type":"cut"} ] }

```

4. Printer status and print results reported data format

Cloud printer reports the device status and print results by assigning the theme, and the data is organized in JSON format.

Keywords	Type	Instruction	Remark
devicename	string	Printer Deviceid	Consistent with the DeviceName or ClientID for the triples
id	Uint32	Printer job id, Consistent with the job ID pushed by the server	Please note that this item does not include it when reporting the status of the printer.
code	int	0: Printing successful 100: Unknown Error Comm Error 101: Paper out 102: Cover open 103: Printer overheated 109: USB printer not connected 201: no id 202: no type 203: Invalid type	

		204: no message 205: Invalid msg, Msg links the non-standard HTTP 206: Download error (repeated download 3 times) 207: Task length buffer overrun 208: Invalid json 209: Repeat tasks without printing	
--	--	---	--

样例:

```
{"devicename":"SW250910001","code":101} //Cloud printer status report: Out of paper.
```

```
{"devicename":"SW250910001","id":123456,"code":0} //he print job with ID 123456 has been printed successfully.
```

5. Write to the MQTT tool usage indication

For the convenience of developers and users to develop and test cloud printing functions, PC based<Cloud printer configuration tool>software is provided, and users can write their own MQTT configuration parameters to the printer.

Tool supports writing server parameters such as Ali Cloud, and self-built MQTT.

Preparation before operation:

1. Prepare MQTT parameters
2. Turn on the printer and connect it to the PC via a USB data cable (parameters are written to the printer via USB)

1. Alibaba Cloud Public Instance

云打印机配置工具

阿里云MQTT / 自建MQTT / 腾讯云MQTT / SN及密钥 / 其他

ProductKey: iiojn

DeviceName: SW231200219 填入阿里云三元组参数

DeviceSecret: 311e63a57b5cd5c

阿里云URL: iot-as-mqtt.cn-shanghai.aliyuncs.com 选择公共实例, URL使用默认

MQTT端口: 1883

实例类型: 阿里云公共实例

订阅主题: user/get

发布主题: user/update 发布和订阅只需要填自定义部分

打印自检页 写入完可打印自建页确认 写入打印机

阿里云MQTT三元组配置

2. 阿里云企业实例

云打印机配置工具

阿里云MQTT / 自建MQTT / 腾讯云MQTT / SN及密钥 / 其他

ProductKey: iiojn3

DeviceName: SW231200219

DeviceSecret: 311e63a0ad125ca0c53d24459

阿里云URL: iot-06bmen3z.mqtt.iothub.aliyuncs.com 企业实例需要填入URL

MQTT端口: 1883

实例类型: 阿里云企业实例

订阅主题: user/get

发布主题: user/update

打印自检页 写入打印机

阿里云MQTT三元组配置

3. 自建 MQTT

云打印机配置工具

阿里云MQTT / 自建MQTT / 腾讯云MQTT / SN及密钥 / 其他

clientID/SN 填入机器码/SN

domain/IP 填入域名或IP

PORT 填入端口

username 填入用户名

password 填入密码

sub_topic 填入完整的设备订阅主题

pub_topic 填入完整的设备发布主题

打印自检页 写入打印机

自建MQTT参数配置

4. 腾讯云 MQTT

云打印机配置工具

阿里云MQTT / 自建MQTT / 腾讯云MQTT / SN及密钥 / 其他

ProductKey: K3IS[redacted] 填入腾讯云MQTT三元

DeviceName: [redacted]04300001 组参数

DeviceSecret: nIGVV+R[redacted]PN55MA==

MQTT端口: 1883

订阅主题: user/get

发布主题: user/update 订阅和发布只需要填入自定义字段

打印自检页 写入打印机

配置设备编号及密码

Appendix 1: Printing and Typesetting Instructions Based on JSON

1. JSON Ticket Printing and Typesetting

Attribute	Type	Description	Explanation
type	string	title: Ticket title (centered, font size doubled)	
		text: Line character printing content	Value is a string or an array
		png: PNG image base64 encoded data or URL download link	The image should not exceed 60K at most
		bmp: Bitmap image base64 encoded data or URL download link	The image should not exceed 6K at most
		qrcode: QR code	Maximum 512 bytes
		bc128: Default CODE128A bc128a: CODE128A bc128c: CODE128C	CODE128A has a maximum of 14 digits and uppercase letter combinations; CODE128C is a string of pure numbers (0-9

			combination)
		div_line: A line divider with '-'	Supports inserting content in the center
		div_star: A line divider with '*'	Supports inserting content in the center
		cut: Cutter instruction, corresponding to full cut and half cut	"0": Full cut "1": Half cut
		plugin: Open the cash drawer	
align	string	left: Left-aligned, default attribute center: Centered right: Right-aligned	Row alignment attribute
bold	boolean	true: Bold false: Not bold (default attribute)	Font bold attribute; if no bold is needed, it can be omitted
size	string	Consists of two numbers, such as "11". Different for type: text ("AB" means set the width multiplier as A times and the height multiplier as B times)	Font, QR code, barcode size attribute

		A is the width multiplier, with a value range of 0 - 7, default is 0 B is the height multiplier, with a value range of 0 - 7, default is 0 qrcode (value is "01" - "09", default is "04") QR code size bc128 ("AB" means A corresponds to the width and B corresponds to the height) A: Barcode width 1 - 6, default is 2 B: Represents the barcode height, $B = 0 - 9$, $H = (b + 1) * 3\text{mm}$, default is 2	
both_sides	array	The array supports two string objects (the first string object is left-aligned, and the second string object is right-aligned; for example {"both_sides":["Payment Amount","258.00"]})	Printing content
cont	string	text: It is a string	Printing content

thead	array/object	key Table header content value Column width percentage	Used for multi-column tables
tbody	array	Multi-column table content Content is an array	Table object supported attributes: size: Set a unified column content text size, supports only height multiplier, height and width multipliers line_div: Row divider line (dashed) line_space: Row spacing, of Number type, value is the row spacing dot value (for thermal printers, 8 dots = 1mm)

Example (double-click to open):



json打印demo20240410.txt

文本行
文本行加粗
字体放大1倍
字体放大2倍

标题

包含标题的多列

名称	单价	数量	金额
番茄炒蛋	24	2	48
西红柿炒番茄	24	7	168
鸡蛋炒鸭蛋	24	1	24
野山椒炒土豆	24	3	72

不含标题的多列

番茄炒蛋	24	2	48
西红柿炒番茄	24	7	168
鸡蛋炒鸭蛋	24	1	24
野山椒炒土豆	24	3	72

*****多列字体放大及分割线*****

序号	名称
1	番茄炒蛋+萝卜牛腩+小炒肉+例汤
2	123456788888
3	鸡蛋炒鸭蛋

*****条码示例*****

123456789

123456789

123456789

*****左右对齐示例*****

收款金额

收款金额 258.00

*****二维码示例*****



```

["print":{
  ["cont":"标题","type":"title"],
  ["cont":"文本行","type":"text"],
  ["cont":"文本行加粗","type":"text","bold":true],
  ["cont":"字体放大1倍","type":"text","size":"11"],
  ["cont":"字体放大2倍","type":"text","size":"22"],
  ["cont":"","type":"text"],
  ["type":"div_line","cont":"包含标题的多列"],
  ["thead":{"名称":"50%","单价":"15%","数量":"15%","金额":"20%"},
  "tbody":[
    ["番茄炒蛋",24,2,48],
    ["西红柿炒番茄",24,7,168],
    ["鸡蛋炒鸭蛋",24,1,24],
    ["野山椒炒土豆",24,3,72] ] },
  ["cont":"","type":"text"],
  ["type":"div_line","cont":"不含标题的多列"],
  ["thead":{"50%","15%","15%","20%"},
  "tbody":[
    ["番茄炒蛋",24,2,48],
    ["西红柿炒番茄",24,7,168],
    ["鸡蛋炒鸭蛋",24,1,24],
    ["野山椒炒土豆",24,3,72] ] },
  ["cont":"","type":"text"],
  ["type":"div_star","cont":"多列字体放大及分割线"],
  ["size":"11",
  "line_div":1,
  "thead":{"序号":"20%","名称":"80%"},
  "tbody":[
    [1,"番茄炒蛋+萝卜牛腩+小炒肉+例汤"],
    [2,"123456788888"],
    [3,"鸡蛋炒鸭蛋"] ] },
  ["cont":"","type":"text"],
  ["type":"div_star","cont":"条码示例"],
  ["cont":"123456789","type":"bc128","align":"left","size":"11"],
  ["cont":"123456789","type":"bc128","align":"left","size":"22"],
  ["cont":"123456789","type":"bc128","align":"left","size":"33"],
  ["cont":"","type":"text"],
  ["type":"div_star","cont":"左右对齐示例"],
  ["both_sides":["收款金额","258.00"],
  ["both_sides":["收款金额","258.00"], "size":"22"],
  ["cont":"","type":"text"],
  ["type":"div_star","cont":"二维码示例"],
  ["cont":"http://www.sw-aiot.com","type":"qrcode","align":"center",
  "size":"60"],
  ["cont":"1","type":"cut"}
}

```

2. JSON Label Printing and Typesetting

	Attribute	Type	Explanation
Label	SIZE	Array	The size of the entire label: width

Parameters			and height, in millimeters (mm) Example: "SIZE":[76, 130] represents a label with a width of 76mm and a height of 130mm
	DIRECTION	Number	The direction of the label content (for the paper output direction), with a value of 0 or 1
	DENSITY	Number	Printing density: value range 1 - 15
	SOUND	Number	The number of times the buzzer sounds; an optional parameter, if included, the buzzer will sound during printing
打印内容 (公共属性)	label	Array	Label content Each element is a JSON array unit
	type	string	Element type: "TEXT" Text "QRCODE" QR code "BC128" Barcode, BC128 format "BAR" Line "BITMAP" Bitmap (supported)
	x	Number	The horizontal starting coordinate of the element on the label (the

			upper left corner is the coordinate origin), in (dot) 1mm = 8 dot
	y	Number	The vertical starting coordinate of the element on the label (the upper left corner is the coordinate origin), in (dot) 1mm = 8 dot
	cont	String	Printing content
	r	Number	The rotation angle of the element: 0, 90, 180, 270
Element-Specific Attributes		TEXT	w: Width magnification factor, of Number type, value range 0 - 8 h: Height magnification factor, of Number type, value range 0 - 8
		QRCODE	e: QR code error tolerance level, default is "M"; w: The width of each small square, of Number type
		BC128	h: Barcode height, in dot, of

			Number type show: Whether to display characters, value is 0 / 1 narrow: The narrow line width of the barcode, in dot, default is 1 wide: The wide line width of the barcode, in dot, default is 1
		BAR	w: Line width, of Number type h: Line height, of Number type
		BITMAP	Supports bmp bitmaps with a bit depth of 1 (can be generated using the Windows built-in Paint tool), content is the base64 data of the image

Example(txxt double-click to open):



label.json.txt

```
{
  "SIZE":[60, 40], "DIRECTION":0, "DENSITY": 7, "SOUND":3,
  "label":[
    {"type":"TEXT", "x":10, "y":20, "font":"2", "w":2, "h":2, "r":0, "cont":"放大 1 倍"},
    {"type":"TEXT", "x":240, "y":40, "font":"2", "r":0, "cont":"默认字体"},
    {"type":"QRCODE", "x":10, "y":70, "e":"M", "w":5, "cont":"12345678"}
  ]
}
```

```
{"type":"BC128", "x":240, "y":70, "h":30, "show":0, "r":0, "narrow":1,
"wide":1, "cont":"1234567889"},
{"type":"BC128", "x":240, "y":120, "h":30, "show":1, "r":0, "narrow":1,
"wide":1, "cont":"1234567889"},
{"type":"BAR", "x":10, "y":300, "w":420, "h":4},
{"type":"BITMAP", "x":10, "y":200,
"cont":"Qk1iCQAAAAAAD4AAAAoAAAABAEAAEEAAAAABAAEAAAAAACQJAADDDgAAww4AAAA
AAAAAAAAAAAAAP///wCAB///8AA//////////AAAAAAAA///gAA////////
//////////AAAAAAAA///gAA//////////AAAAAAAA///AAB////////
//////////AAAAAAAA///+AAD//////////AAAAAAAA///8AAH///
//////////AAAAAAAA///4AAP4AAA/8ADgP/wHgPgD//4A8A8B//AP/8AABAAAA
AAA//wAAfwAAA/wADgP/wHAPwB//wA8A8B//AP/wAABAAAAAAA///gAAfAAAA/AADgP/wHAP4
A//gB8A8B//AP/AAABAAAAAAA///AAA+AAAA+AADgP/wHAP4Af/AD8A8B//AP+AAABAAAAAAA///
AAB8AAAA+AADgP/wHAP8AP/AH8A8B//AP8AABAAAAAAA//+AAD8AAB8AH/gP/wHAP+AH+AH
8A8B//AP4AABAAAAAAA//8AAH4B///8A//gP/wHAP/AH8AP8A8B//AP4A/4BAAAAAAA//4AAPw
D///8B//gP/wHAP/AD4Af8A8B//APwD/4DAAAAAAA//wAAfwH///4B//gP/wHAP/gB4A/8A8B//AP
wH/wHAAAAAAA//gAA/wH///4B//gP/gHAP/wAwB/8A8B//APgP/gHAAAAAAA//AAA/wOAB/4D//g
AAAHAP/4AgB/8A8B//APgP/gPAAAAAAA//+AAB/gOAB/4B//gAAAHAP/8BAD/8A8B//APgf/APAAAA
AAA/8AAD/geAA/4B//gAAAHAP/8DAH/8A8B//APgf/AfAAAAAAA/8AAH/geAA/8A//gAAAHAP/+GA
P/8A8B//APgf+A/AAAAAAA/4AAP/geAAf8AP/gAAAHAP/+GAP/8A8B//APgf+A/AAAAAAA/wAAf/gP
AAP+AH/gAAAPAP/8DAH/8A8B//APgf8B/AAAAAAA/gAA//gP/gP/AD/gAAAfAP/4BAD/8A8B//APgf4
D/AAAAAAA/AAB//wP/wH/gB/gP///AP/4AgB/8A8B//APgP8D/AAAAAAA+AAD//wH/wH/wA/gP///
AP/wAwA/8A8B//APwP///AAAAAAA8AAD//wD/4D/4Af/gP///AP/gB4A/8A8B//APwH///AAAAAAA4
AAH//4B/4B/8APgP///AP/AD4Af8A8B//Afwd///AAAAAAA4AAP//4AAAB//+APgP///AP+AH8AP8A8
B/4Af4A///AAAAAABwAAP//8AAAA//AHgP///AP+AP+AH8A8AAAA/8AAABAAAAAAA4AAH//+AAA
A//gHgP///AP8Af/AD8A8AAAA/8AAABAAAAAAA8AAD///AAAA//gHgP///AP4Af/gD8A8AAAB//+AA
ABAAAAAAA+AAD///gAAA//wHgP///APwA//gB8A8AAAH//AAABAAAAAAA/AAB///4AAA//wHgP//
/APgB//wA8A8AAAP//wAABAAAAAAA/gAA///AAB//wHgf///gfgD//8A+B8AAA//+AABAAAAAAA/
gAAf//////////AAAAAAAA/wAAP////////wf//////////AAAA
AAA/4AAH////////gf//////////AAAAAAAA/8AAD///85/gP///AAADAP//+AAAAA//+
AAAAAAAAAAAAA//+AAB///8Yzgf///AAABAH//+AAAAAAf//+AAAAAAAAAAAAA//AAA///8Yxwf//
/AAAAgH//+AAAAAAf//+AAAAAAAAAAAAA//gAAf///8Yx4///AAAAwH//+AAAAAAP//+AAAAAAA
AAAA//wAAf///8Y4///Af//wH//AB////////wB//AAAAAAA//4AAP///8cyf///Af//wH//wA////
//gAAAAABAAAAAAA//8AAH///+Mch///Af//wH//4Af///gAAAAABAAAAAAA//+AAD///+OOH//
//AAAAAH//+AH////////gAAAAABAAAAAAA//AAB///+GHn///AAAAAH//gB///gAAAAABAAAAAA
A//gAA///HD///AAAAAH//wA///Afwb//AAAAAAA//gAAf///jg////////8AP///AA
AAABAAAAAAA//wAAP///hwP///8AA/4AB///+AH///+AAAAABAAAAAAA//4AAH///w8P///8A
AAAAB///gB///gAAAABAAAAAAA//8AAH///4fP///8AAAAAB///wA///gAAAABAAAAAAA//
+AAD///8H///8AAAAAB///8AP///wDwB//AAAAAAA//AAB///+B///AAAD///AH///gAA
AwBAAAAAAA//gAA///gf///8APwA///gB///gAAQBAACAACAA//wAA///wf///8A//AP
///4A///gAAABAAAAADAD////////+f///8A/ADAH///8AP//gAAABAAAAAD////////
//+AAAAAD///AH//gH//4BAAAAD////////gAAAAD///gB///gAAAABAAAAAD/////
////////gD//4D//gAAAAA//gAAAABAAAAAD////////4AD//4B//gAAAAA//gAAAAB
AAAAD////////4B//4B//gAAAAA//gH//4BAAAAD////////4AAAAAB///4B//
```

```
///gAAAABAAAAD////////////////4AAAAAB///8B///gAAAABAAAAD////////////////8AAA  
AAB///8B///gAAAABAAAAD////////////////AP////////////////gAAAABAAAAA="}  
]  
}
```