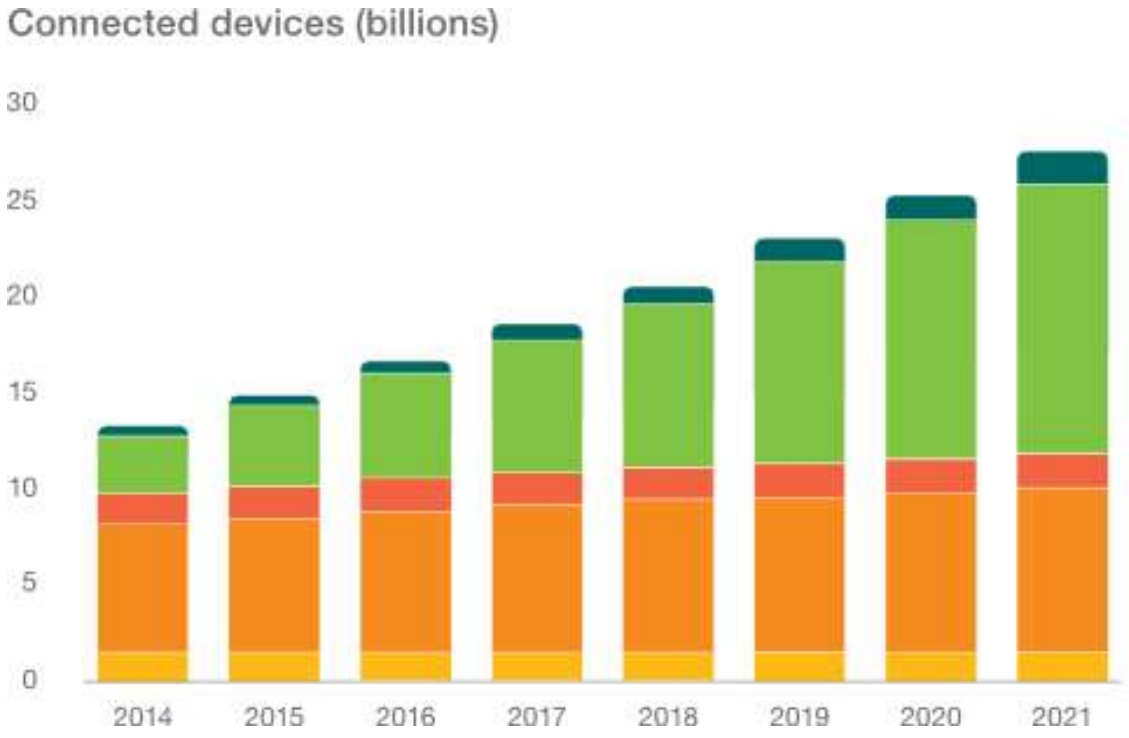
Public

Controlling the Internet of Things with Hana Cloud Platform

Matias Schertel, SAP
November, 2016

Ericsson Mobility Report / 2016



	15 billion	28 billion	CAGR 2015–2021
Cellular IoT	0.4	1.5	27%
Non-cellular IoT	4.2	14.2	22%
PC/laptop/tablet	1.7	1.8	1%
Mobile phones	7.1	8.6	3%
Fixed phones	1.3	1.4	0%
	2015	2021	

A road with many challenges

...or a Babel tower of protocols!

Popular Protocols

Physical / Data

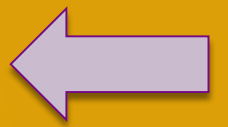
- Phone line
- Ethernet
- DSL
- Wifi
- GSM
- Bluetooth

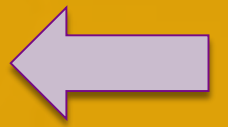
Network / Transport

- ARP
- ICMP
- IPv4
- IPv6
- IPSec
- IPX
- TCP
- UDP

Application

- HTTP(s)
- SOAP
- SNMP
- Websocket
- AMQP
- MQTT
- XMPP





HTTP vs MQTT: Design

HTTP Document-centric

MQTT Message-centric

HTTP vs MQTT: Design

HTTP Document-centric

MQTT Message-centric

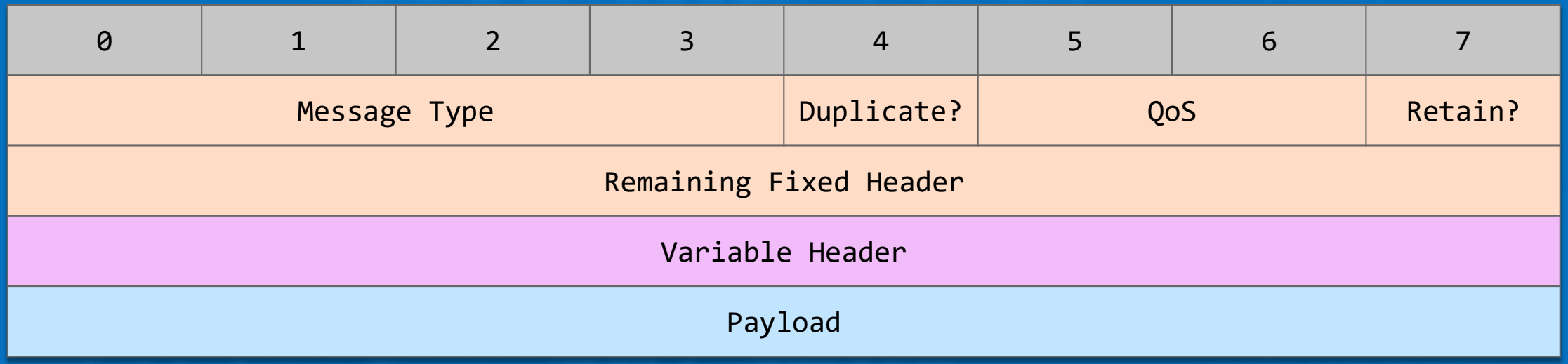
```
GET /tutorials/other/top-20-mysql-best-practices/ HTTP/1.1
Host: net.tutsplus.com
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US; rv:1.9.1.5) Gecko/20091102 Firefox/3.5.5
(.NET CLR 3.5.30729)
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Cookie: PHPSESSID=r2t5uvjq435r4q7ib3vtdjq120
Pragma: no-cache
Cache-Control: no-cache
```

HTTP vs MQTT: Design

HTTP Document-centric

MQTT Message-centric

```
/topic/to/publish/payload
```



HTTP vs MQTT: Messaging

HTTP Request / Response

MQTT Publish / Subscribe

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HTTP Request / Response

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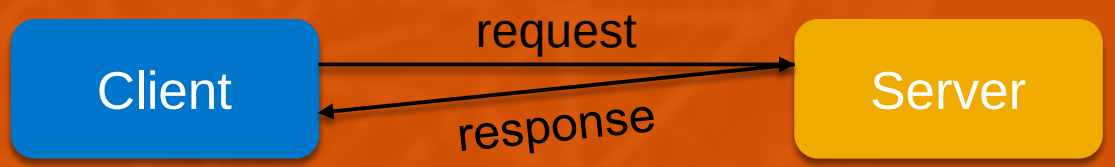
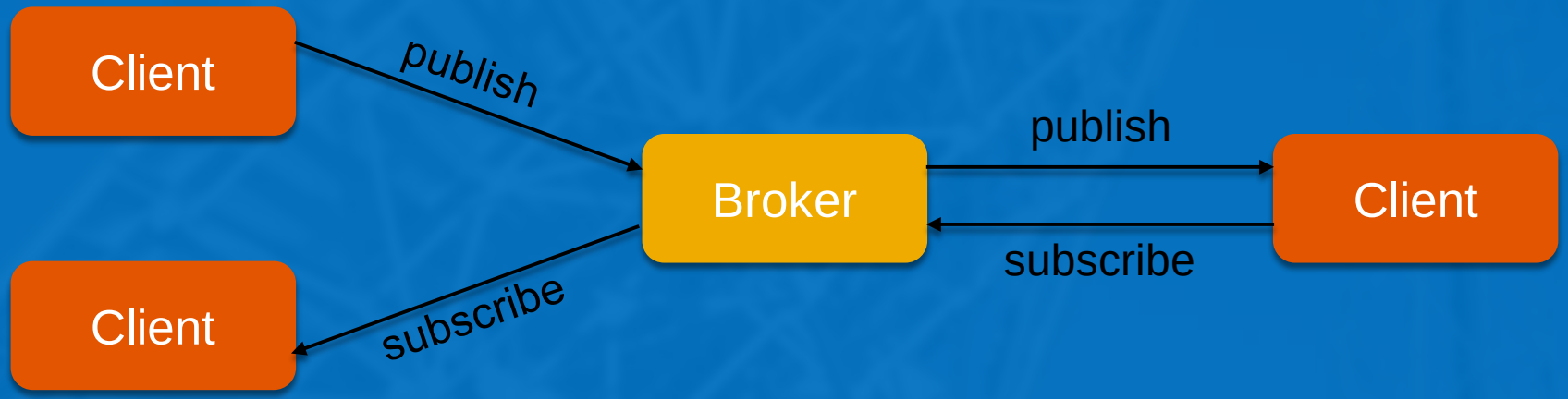


HTTP vs MQTT: Messaging

HTTP Request / Response

MQTT Publish / Subscribe



HTTP vs MQTT: Quality of Service

HTTP

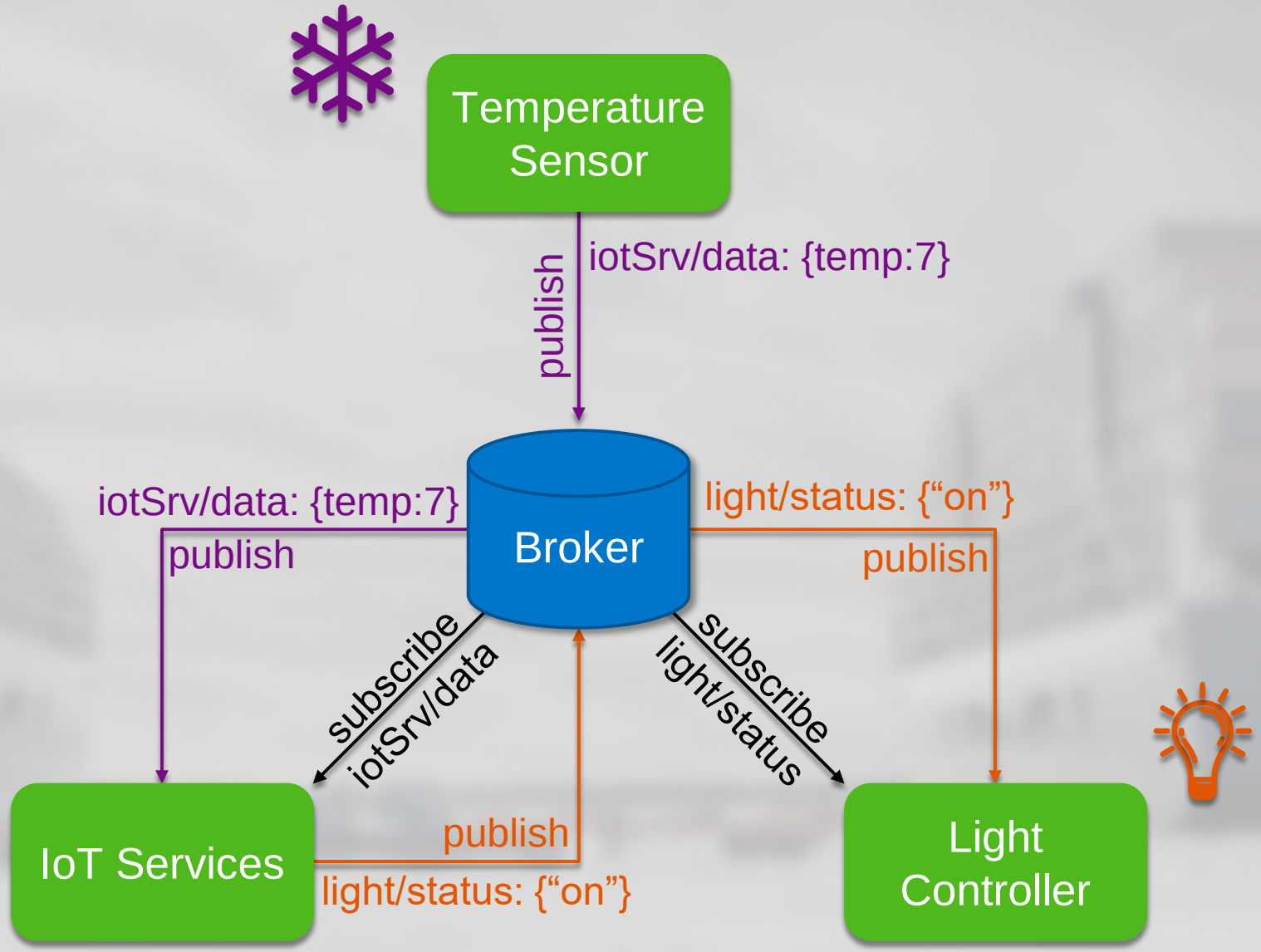
- No QoS

MQTT

- QoS 1: at most once
- QoS 2: at least once
- QoS 3: exactly once

MQTT

Overview

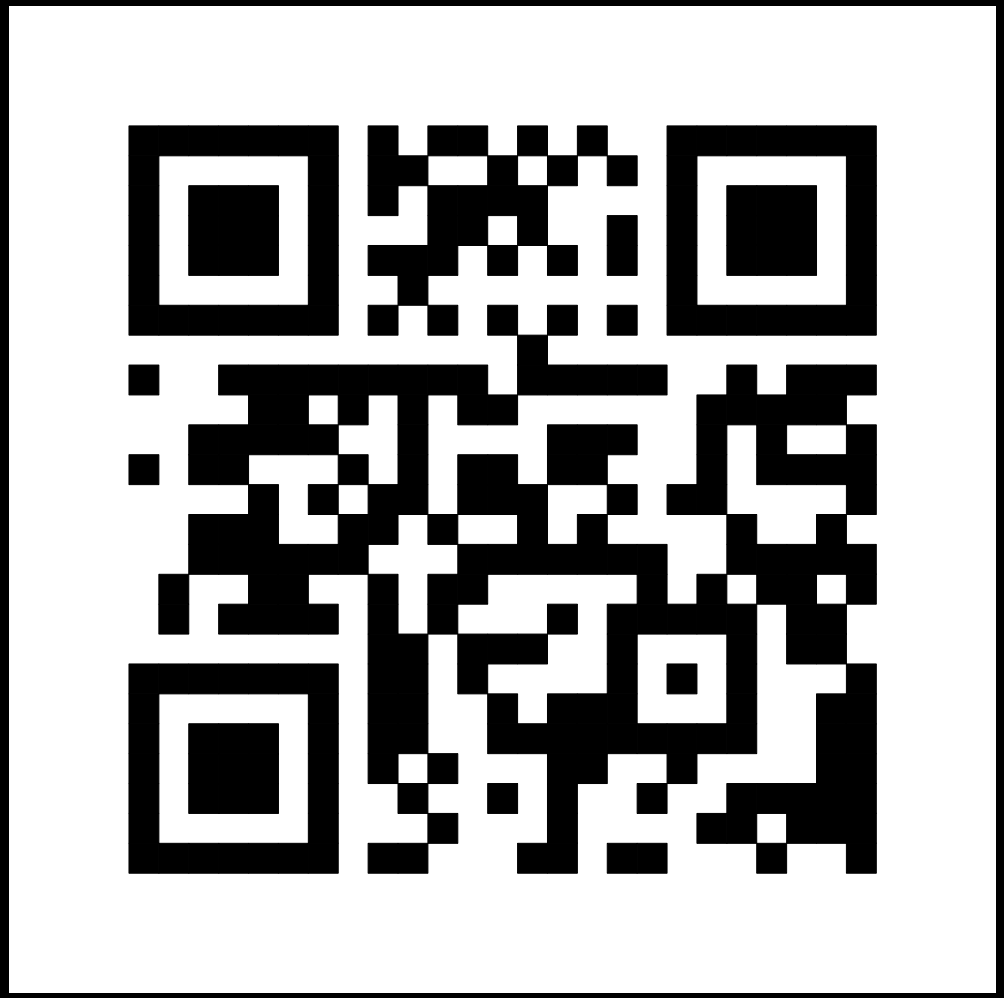

Temperature Sensor
publish
iotSrv/data: {temp:7}
Broker
iotSrv/data: {temp:7}
publish
light/status: {“on”}
publish
subscribe
iotSrv/data
subscribe
light/status
IoT Services
publish
light/status: {“on”}
Light Controller

IoT Service @ HCP

Live Overview

Smart House

Live Demo



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Questions?

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References

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- SAP HANA Cloud Platform Internet of Things Services, https://help.hana.ondemand.com/iot/
  - IoT Starterkit, https://github.com/SAP/iot-starterkit
- MQTT, http://mqtt.org/
- Eclipse PAHO, https://eclipse.org/paho/

- PlatformIO, http://platformio.org/
- ESP8266, https://espressif.com/en/products/hardware/esp8266ex/overview

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