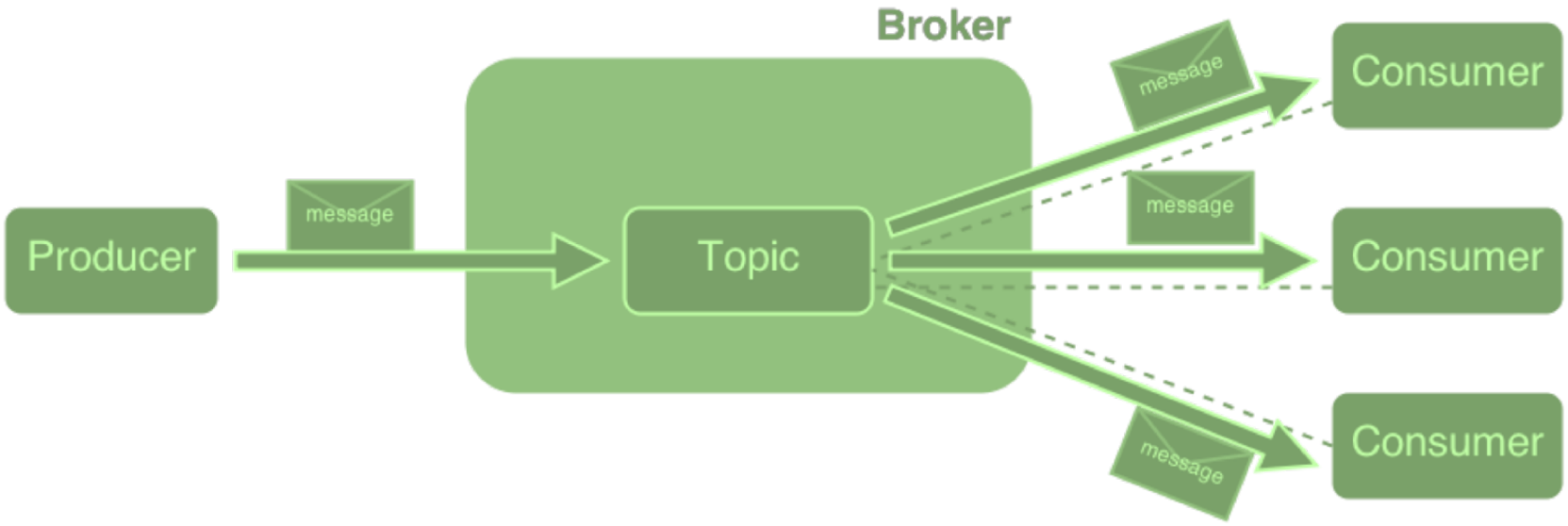
MQTT Pub/Sub
Not just For IoT

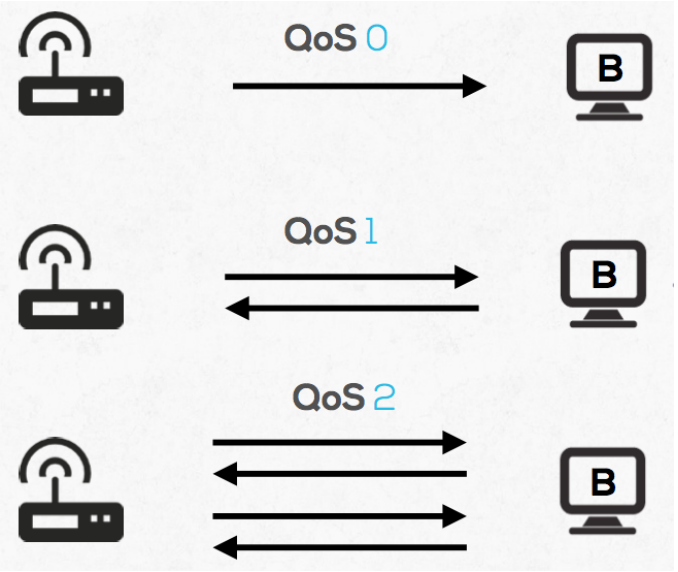
MQTT is a feather-weight ISO Compliant Pub/Sub Messaging protocol.

Chat about this talk at ForestWiki.com

MQTT Pub/Sub

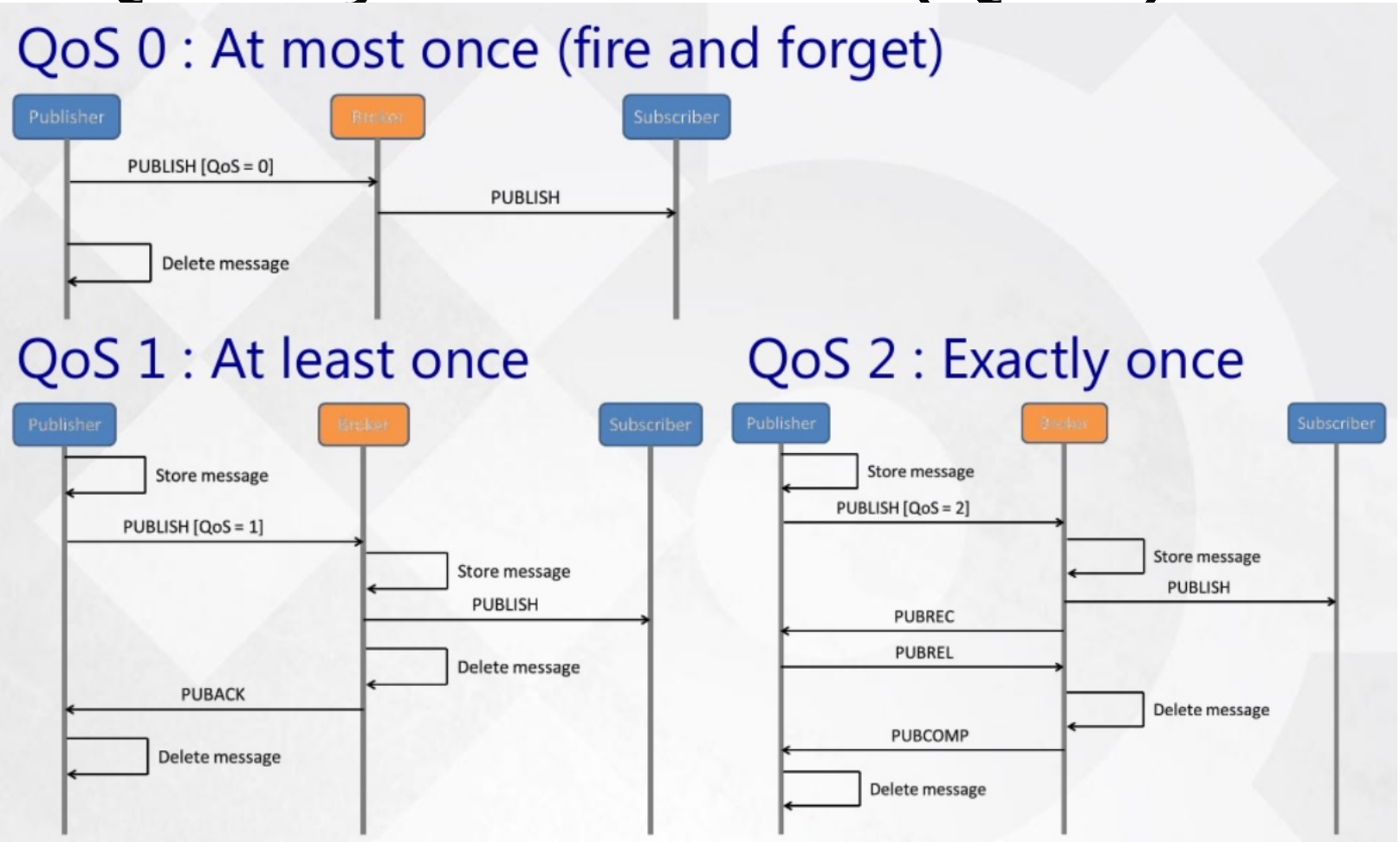

Broker
Producer
message
Topic
message
Consumer
message
Consumer
message
Consumer

3 Quality of Service Levels



- QoS 0: Best Effort
- QoS 1: At Least Once
- QoS 2: Exactly Once

3 Quality of Service (QoS)



https://devopedia.org/mqtt

MQTT Vs HTTP

	3G		Wifi	
	HTTPS	MQTT	HTTPS	MQTT
% Battery / Hour	18.43%	**16.13%**	**3.45%**	4.23%
Messages / Hour	1708	**160278**	3628	**263314**
% Battery / Message	0.01709	**0.00010**	0.00095	**0.00002**
Messages Received	240 / 1024	**1024 / 1024**	524 / 1024	**1024 / 1024**

- https://devopedia.org/mqtt

Why Pub/Sub

MQTT decouples Publishers and subscribers.

- Space: Publishers and Subscribers do not need to know each other’s IP address and Port.
- Time: Publishers and Subscribers do not have to be online at the same time
- Synchronization: Pubishers and Subscribers can operate at their own pace.

MQTT Retained Message

MQTT is a hierarchical key-value store.

Key	Value
K1	AAA,BBB,CCC
K2	AAA,BBB
K3	AAA,DDD
K4	AAA,2,01/01/2015
K5	3,ZZZ,5623

Last Will And Testament

When connecting specify what message to send to what topic on time out.

Google Trends:MQTT

Widely Used

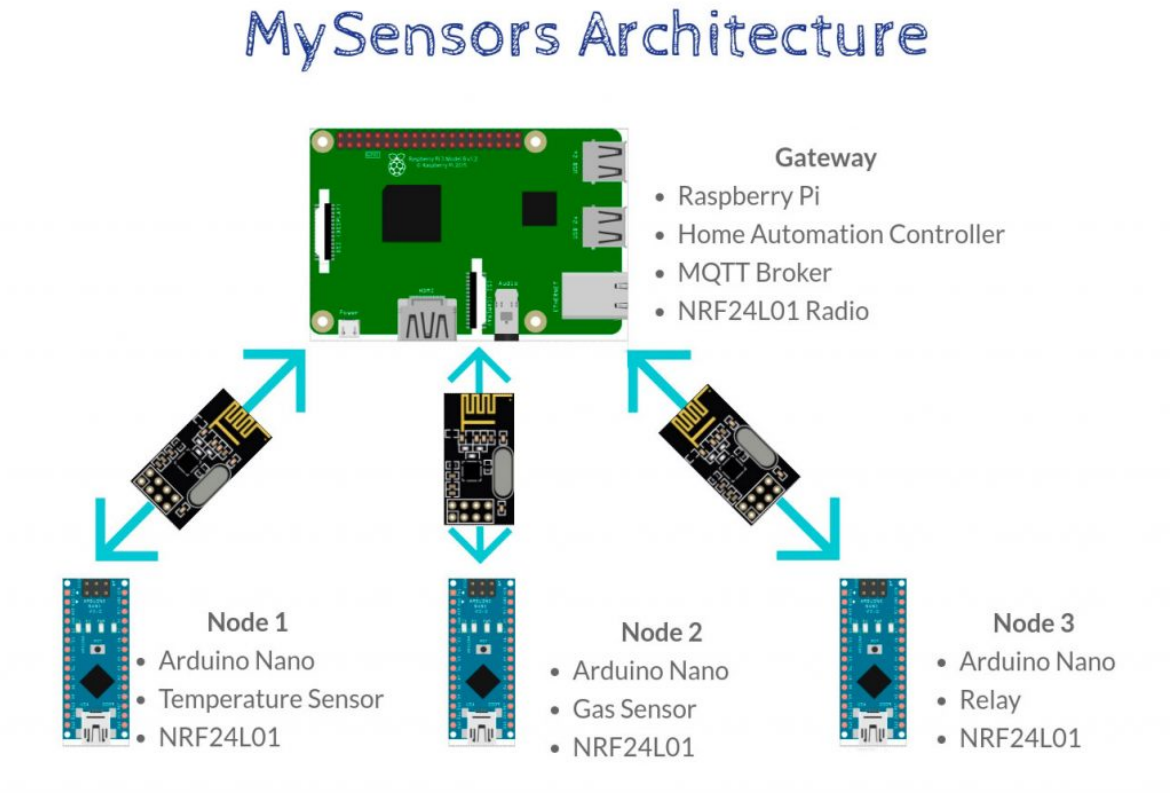
Google Cloud

aws

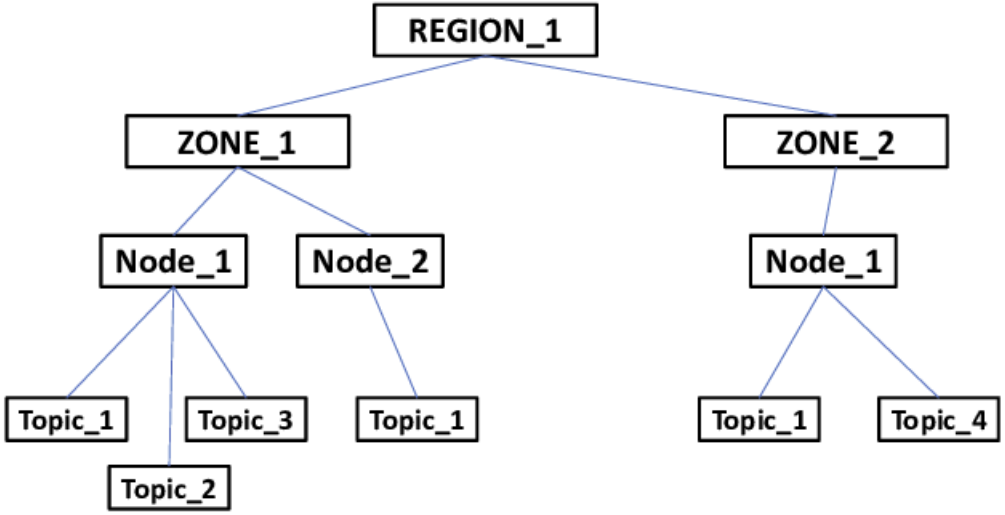
Microsoft Azure

IBM Watson

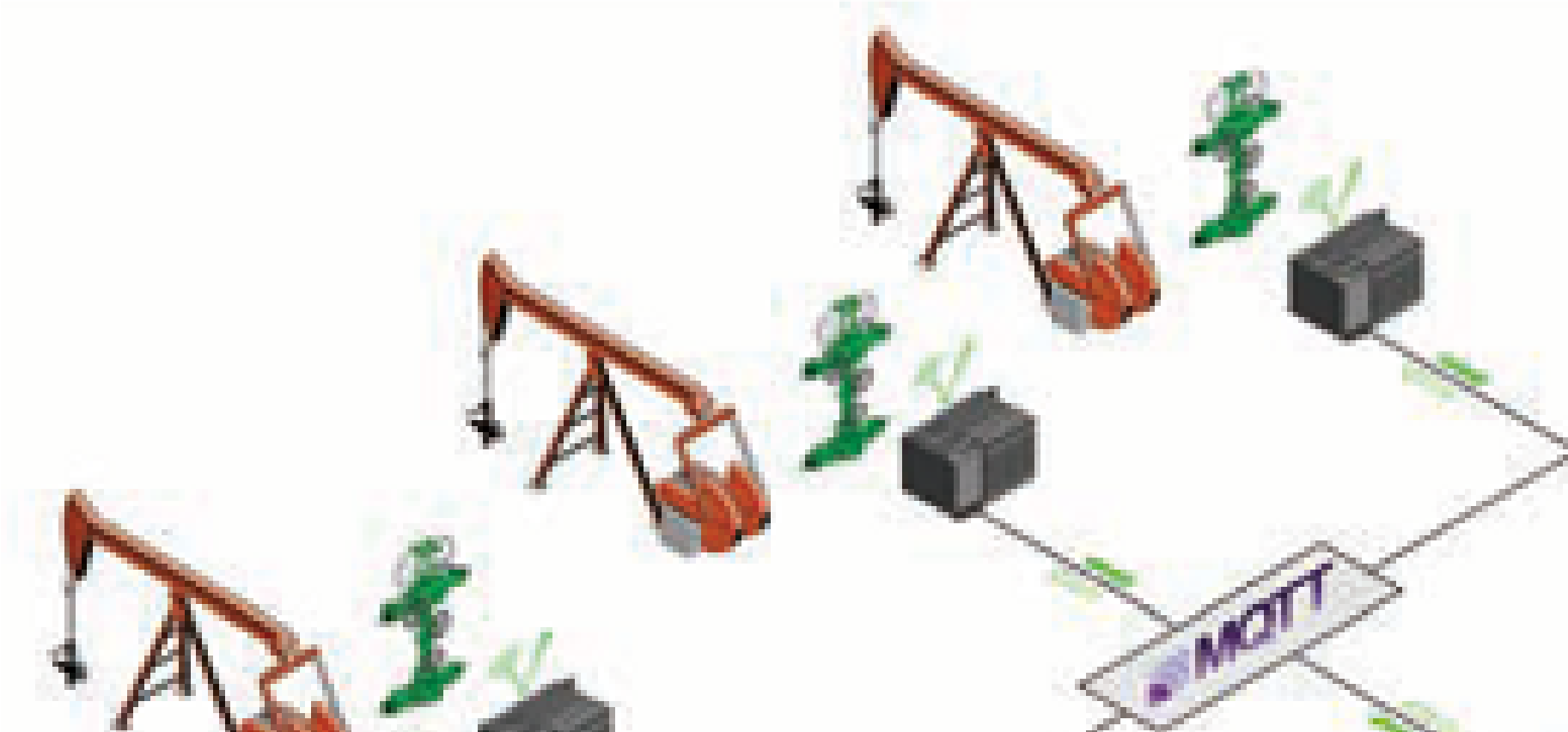
Home Automation



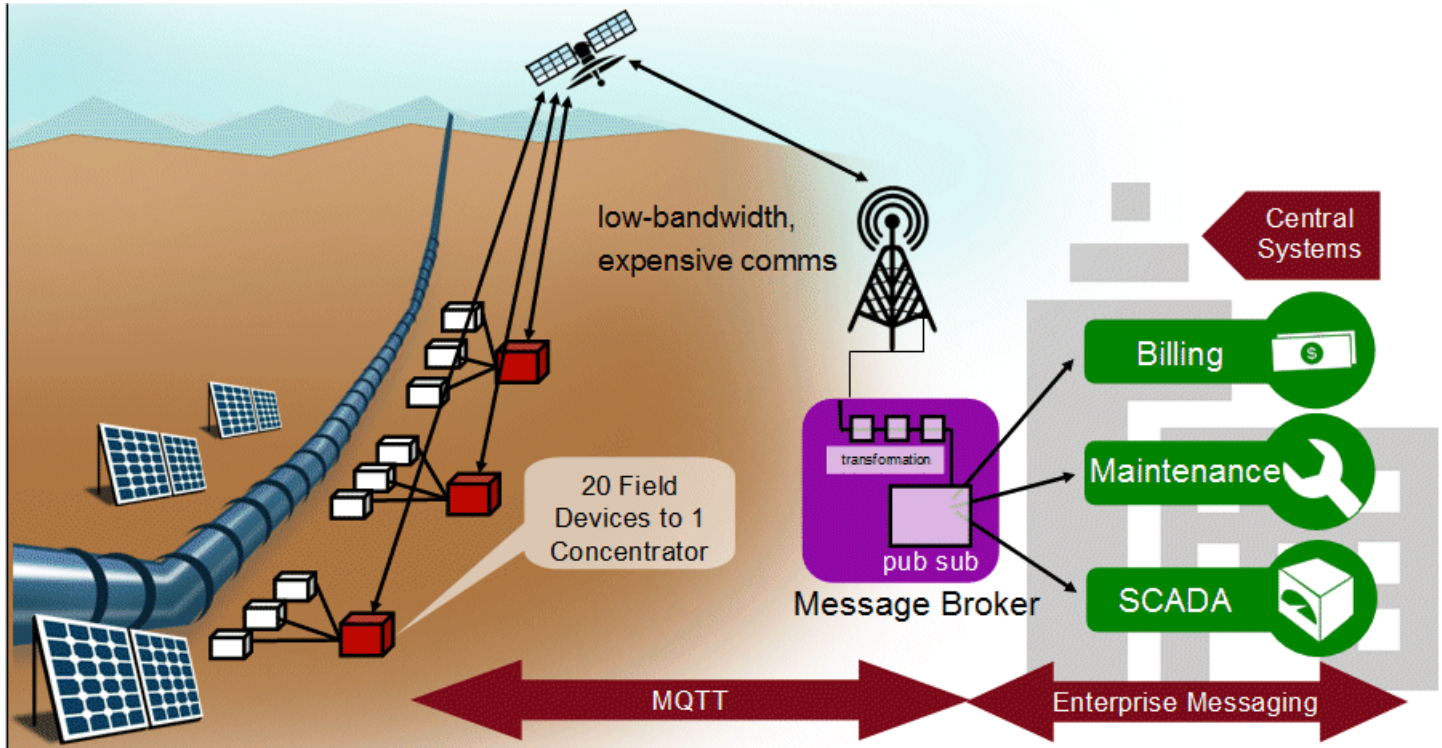
Topic tree


REGION_1
ZONE_1
ZONE_2
Node_1
Node_2
Node_1
Topic_1
Topic_3
Topic_1
Topic_1
Topic_4
Topic_2

MQTT in Drilling

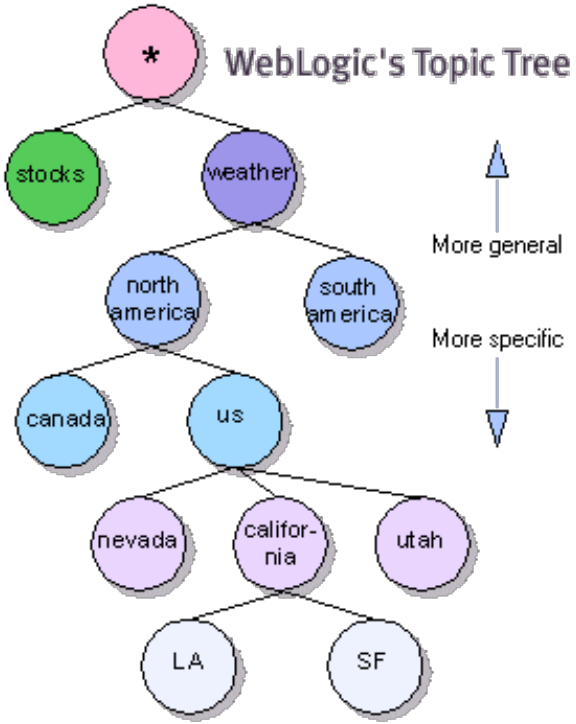


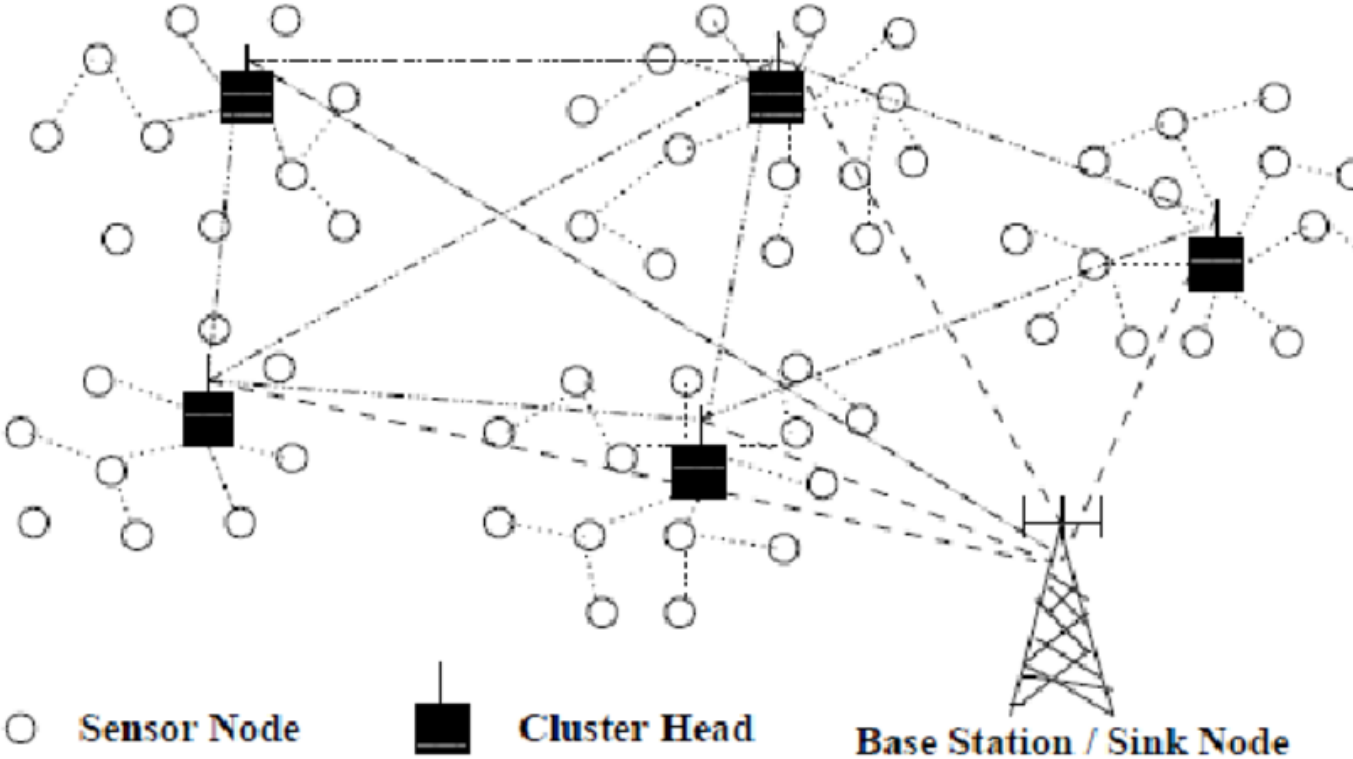
Oil Pipelines

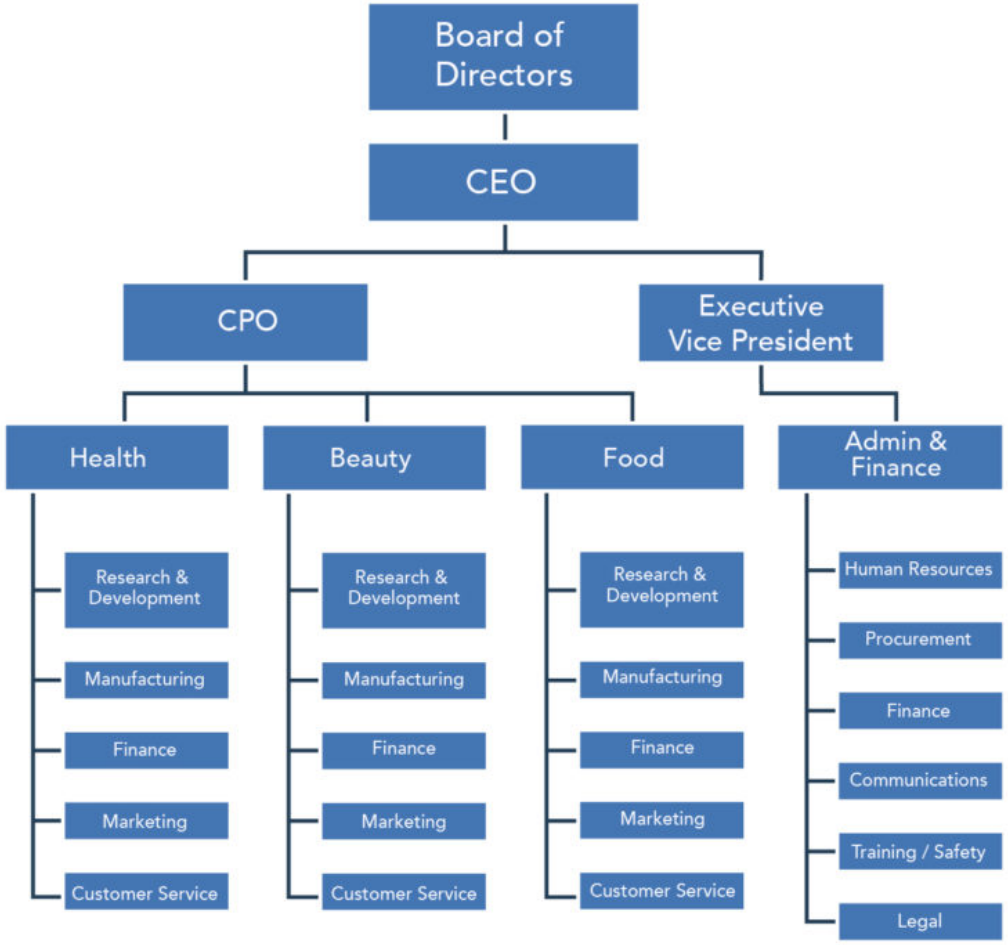


Scalability for whole pipeline!
Network traffic much lower - events pushed to/from devices and report by exception
Network cost reduced
Lower CPU utilization
Broken out of the SCADA prison – data accessible to other applications

One Sensor Configuration







Organizations need a Tree of Chat Servers

Forest Chat Wiki

- Slack and Discord are not trees nor wikis.
- Wikimedia is not a tree and does not do Chat.

Core MQTT Functions

- client := mqtt.NewClient(opts)
- client.Connect()
- client.Publish(topic, qos, retain, msg)
- client.Subscribe(topic, qos, callback)

When Not to USE MQTT

- Reliable Network, and No Pub/Sub.
- You need a Task Queue: Celery.

Start with CloudMQTT

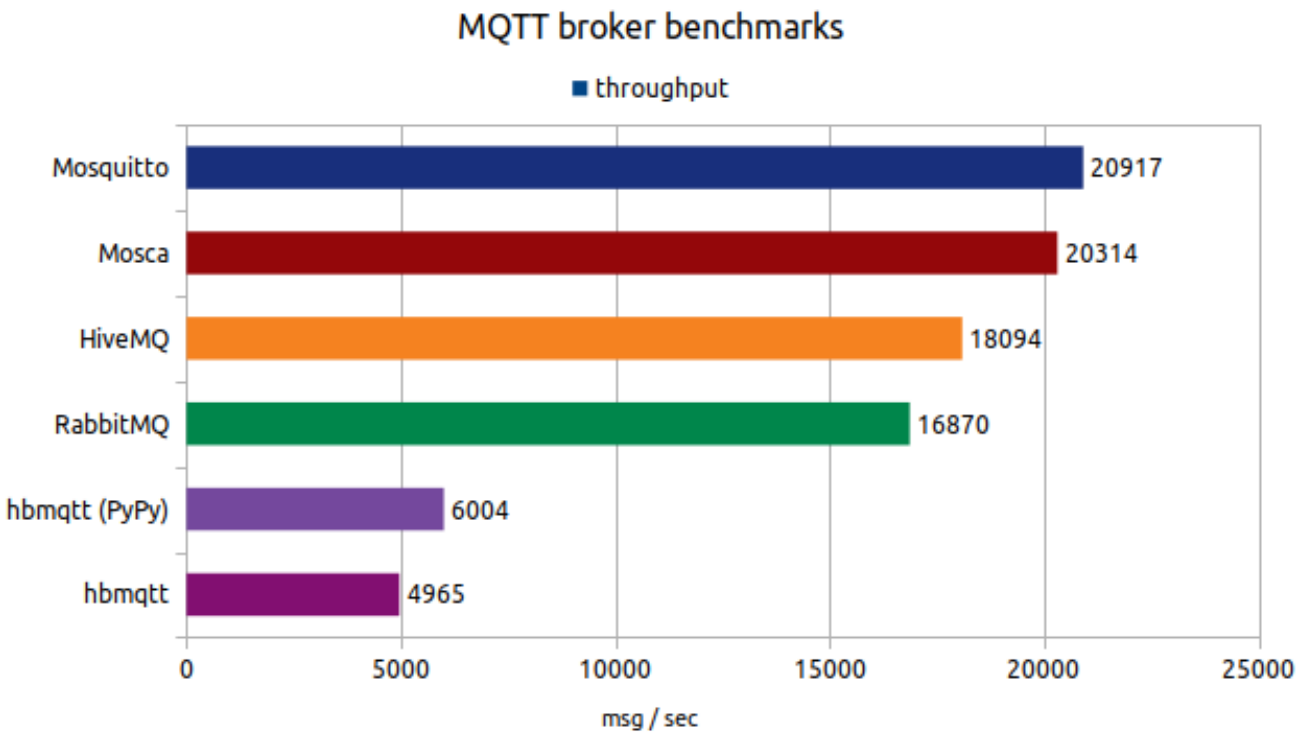
They make it free and trivial to get started.

Let’s Encrypt

Hub.Docker.com/r/pythonlinks/letsencrypt-mosquitto

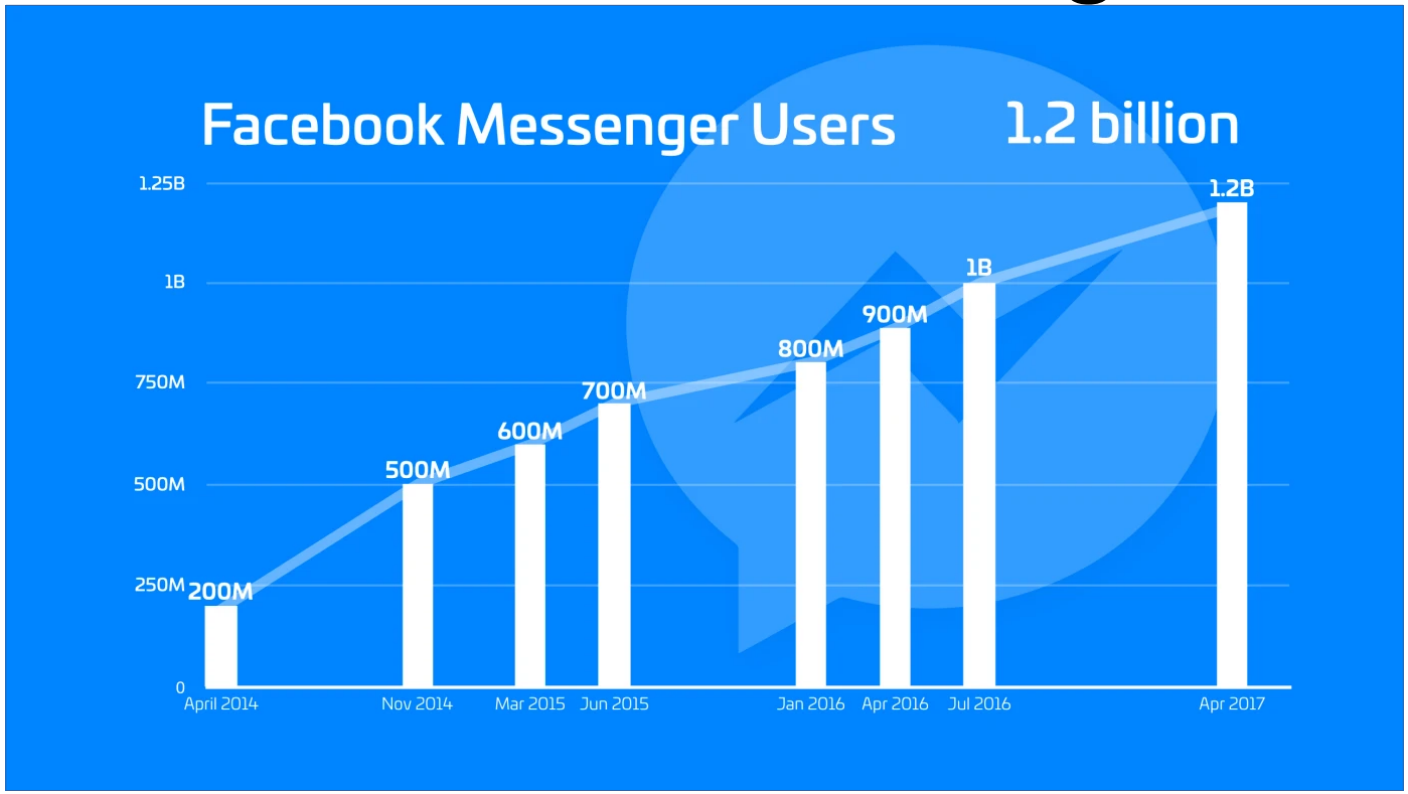
Is a docker container with GoLang’s Caddy Server, mosquitto, and mosquitto-go-auth.

Next release supports Dynamic IP’s.



https://muetsch.io/basic-benchmarks-of-5-different-mqtt-brokers.html

MQTT Scalability
FaceBook Messenger



https://techcrunch.com/2017/04/12/messenger/

MQTT is a Standard

OASIS
The Organization for the Advancement of Structured Information Standards

ISO
International Organization for Standardization

- MQTT 3.1 and 5.0 are standards of the Oasis Organization and now ISO.

MQTT Brokers By Feature

Starter	Test.Mosquitto.org
OnLine	CloudMQTT, Flespi, MyQTTHub, Azure, AWS,Google Cloud, IBM Watson, Alibaba, EMQ X Cloud
Scalable	Emitter.io, EMQX
Distributed Scalable	Akamai
Persistent	Various

MQTT Brokers By Language

C	Mosquitto
Erlang	EMQTT, VerneMQ
GoLang	Emitter, Hrotti, Mystique, SurgeMQs
Python	HbMQTT
Node.js	Mosca, Addes
Java	HiveMQ,ActiveMQ,Moquette
ESP_uMQTT	esp_uMQTT_broker

MQTT Client Libraries

Python	Javascript
GoLang	Erlang/Erlang
C	Swift
Java	.Net
PHP	Clojure
Objective-C	Lua
Dart	Rust
Tcl	Ruby
Delphi	

GoLang Brokers

Name	#Contributors	#Commits
Emitter.io	15	503
HMQ	6	153
go-mqtt	2	145

MQTT is an efficient, reliable, scalable, industry-standard machine-to-machine Pub/Sub messaging protocol with 3 different quality-of-service (QoS) levels , topics, retained messages, and last wills.

Links

- Awesome MQTT

  Github: mosquitto-go-auth

  DockerHub: letsencrypt-mosquitto
- Docker Hub: mqtt-chat-wiki
- MQTT Explorer
- Paho Libraries

Contact Information

Golang Videos.com

@MQTTClass on Twitter

PythonLinks.info

ForestWiki.com

More Code Examples

Search on:

- “Cloudmqtt Golang”
- “Golang MQTT Chat”