

# GISC Tokyo Cloud Project (MQPs)

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# Today's Agenda

- Features of MQPs
- Overview of GISC Tokyo cloud project (MQPs)
- MQPs hands on



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# What is MQPs ?

- MQPs are Messaging Queuing Protocols
- Example of MQPs are MQTT, AMQP, etc
- MQPs are application layer protocols, like HTTP
- MQPs are considered to be an important technology in WIS2.0



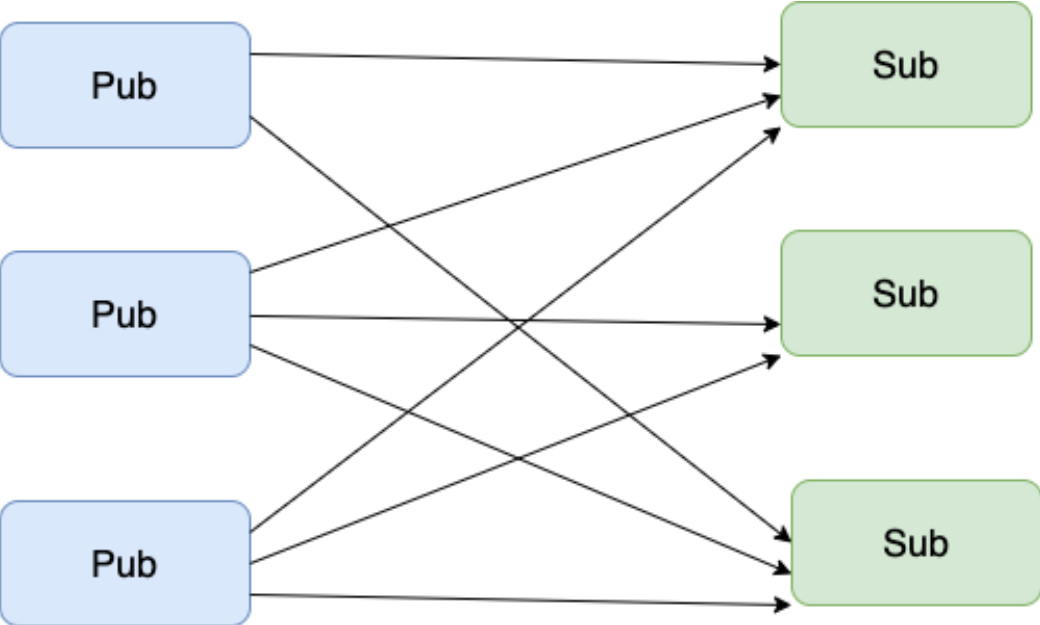
# Good point of MQPs

- Low latency due to always-on connection
- Small network overhead due to small header
- Easy filtering with using “Topic Structure”
- MQPs can use Pub/sub architecture

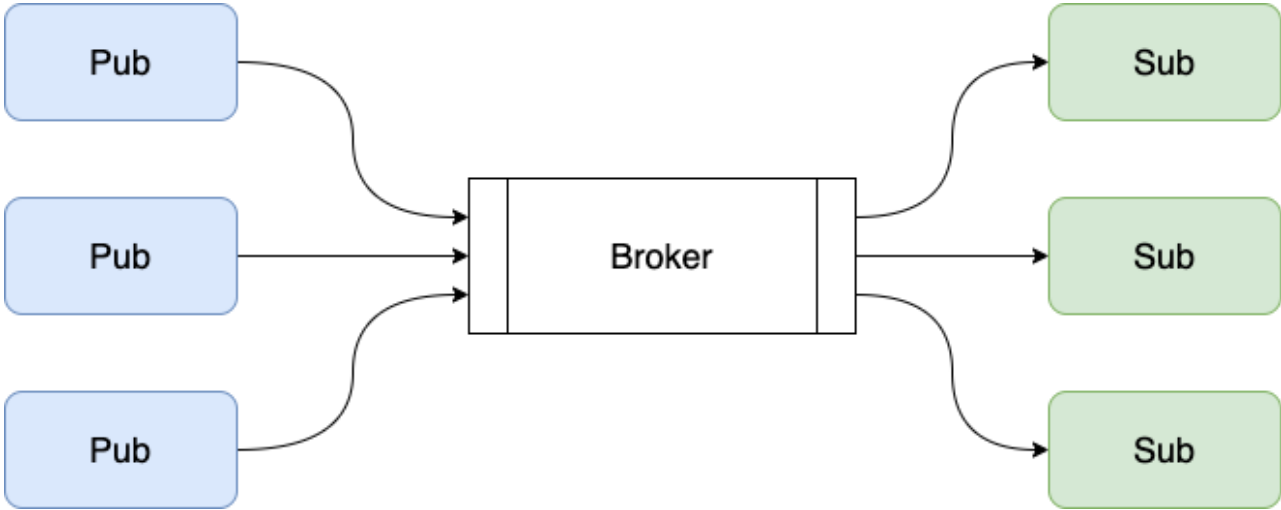


# Pub/sub architecture

Direct exchange  
[ complicated ]



Pub/sub architecture  
[ simple ]



# Change by introducing pub/sub

## JMA push data (NOW)

- NCs manage their server
- If NCs would like to get new kind of data, NCs must tell JMA

## Pub/sub architecture (NEW)

- NCs Don't need Server
- NCs can choose data received anytime.



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# Overview GISC Tokyo cloud project (MQPs)

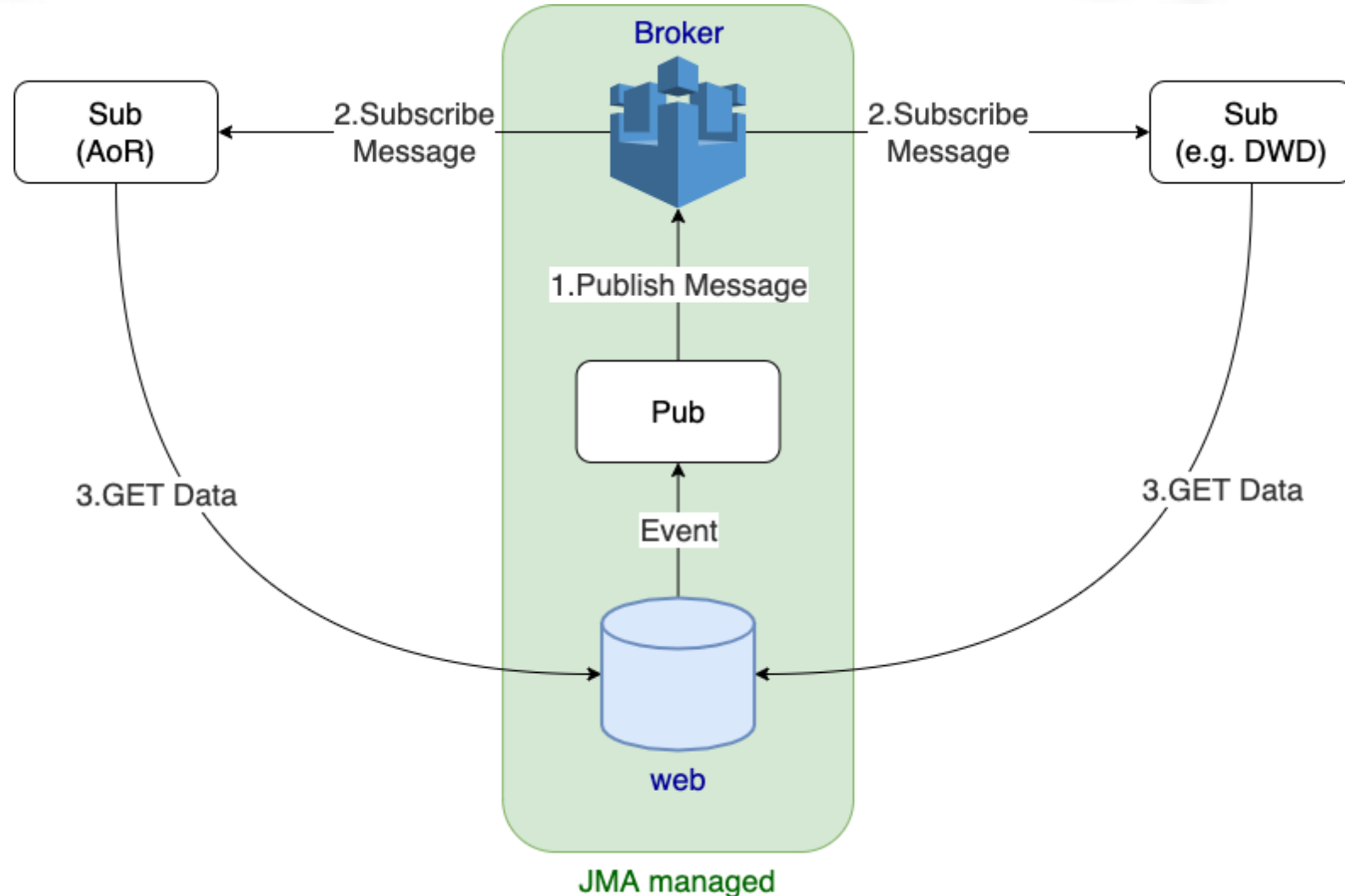
1. JMA publish
2. NCs subscribe
3. NCs Get Data

## Message:

- Format: JSON
- content: URL for Data

## Data :

- Format: BUFR, TAC, etc.
- content : Meteorological Data



# Example of Message

## Message

```
{
  "pubTime": "yyyymmddhhmmss",
  "baseURL": "https://example.com/",
  "relPath": "dir1/dir2/example.dat",
  "size": "xxxxx",
  "integrity": {
    "method": "SHA512",
    "value": "zzzzzzzzz(base64)"
  },
  "content": "",
  "signature": "Japan Meteorological Agency"
}
```

## Extracted URL

<https://example.com/dir1/dir2/example.dat>

- Message include URL
- Access this URL to get Data



# How to Filtering Message

If you need JMA and Synoptic data

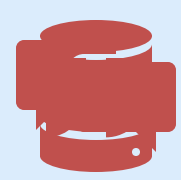
Subscribe following Topic("+ means all) :

WIS/+/+/+/RJTD/+/+/Synoptic/+

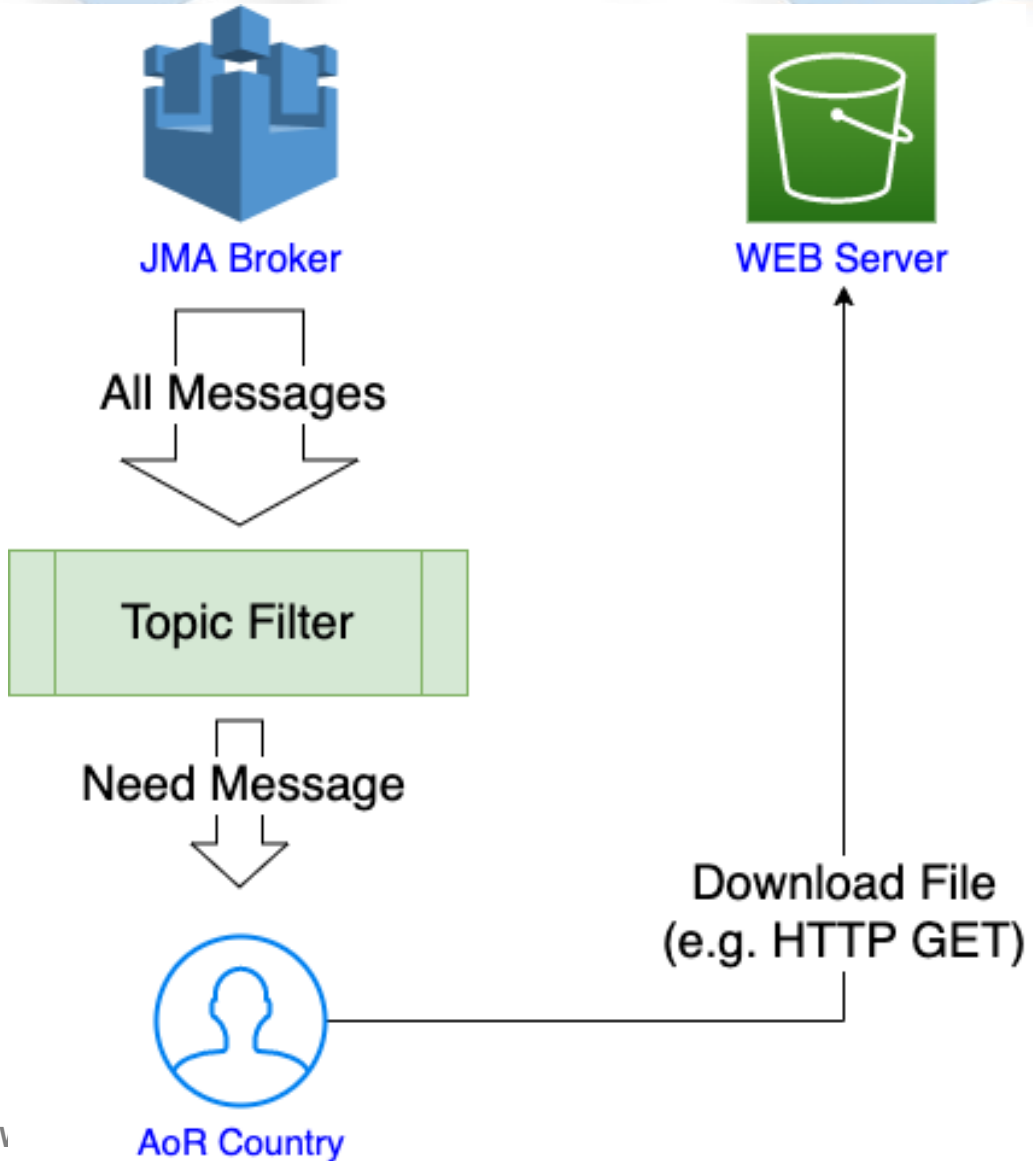
## Topic Structure

WIS/<day>/<time>/<country code>/<CCCC>/<data format>/  
<type>/<class>/<data type>/<data name>





# 3 things receiver should do



Set Topic Filter

Extract URL from JSON

Download File



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# Install software

```
mkdir ~/wis_workshop_2021  
cd ~/wis_workshop_2021
```

```
==== centos =====
```

```
sudo yum -y update  
sudo yum -y install epel-release  
sudo yum -y install mosquitto  
sudo yum -y install curl
```

```
==== ubuntu =====
```

```
sudo apt -y update  
(add-apt-repository ppa:mosquitto-dev/mosquitto-ppa)  
sudo apt install -y mosquitto-clients  
sudo apt install -y curl
```

## Need software

- curl
- Mosquitto



# Receive Message

```
# Download ca_cert
```

```
curl -o isrgrootx1.pem https://letsencrypt.org/certs/isrgrootx1.pem
```

```
# No filter. Receive all message
```

```
mosquitto_sub --cafile ./isrgrootx1.pem -d -h "hostname" -p 8883 -u "user" -P "password" -t "#"
```

“#” means every topic ( = No Filter ).

See following information for User and Password.



# Let's see message

```
{"pubTime": "20211210T150924.613Z", "baseURL": "https://hostname/data", "relPath": "SABM/100500/SNAG03SABM100500RRD.dat", "size": "113", "integrity": {"method": "sha512", "value": "xxxx"}, "content": "", "signature": "Japan Meteorological Agency"}
```

↑ If you can receive message, your terminal show some messages like this.  
(this message is sample, so message on your terminal should be different.)

Make URL with combine baseURL and relPath. In this case,

<https://hostname/data/SABM/100500/SNAG03SABM100500RRD.dat>

baseURL

relPath





# Let's get Data

Username and pass is same for get message.

```
# confirm HTTP status
curl -I https://hostname/data/SABM/100500/SNAG03SABM100500RRD.dat

# download data
curl -O
https://hostname/data/SABM/100500/SNAG03SABM100500RRD.dat

# confirm data you get
ls -la ./
```



# Filtering Message

```
# Get only TEXT format(not bufr or grib)
```

```
mosquitto_sub --cafile ./isrgrootx1.pem -d -h "hostname" -p 8883 -u "user" -P "password" -t  
"WIS/+/+/+/+/TEXT/+/+/+"
```



# Summary

- In pub/sub , NCs don't have to manage server
- NCs can filter need messages with Topic
- Tokyo Pilot project publish messages continuously
- JMA will provide auto subscription tool for this project

**Please feel free to join GISC Tokyo cloud Project (MQPs) !**



Thank you for listening



# appendix



# Data subscription from GISC Tokyo (now)

