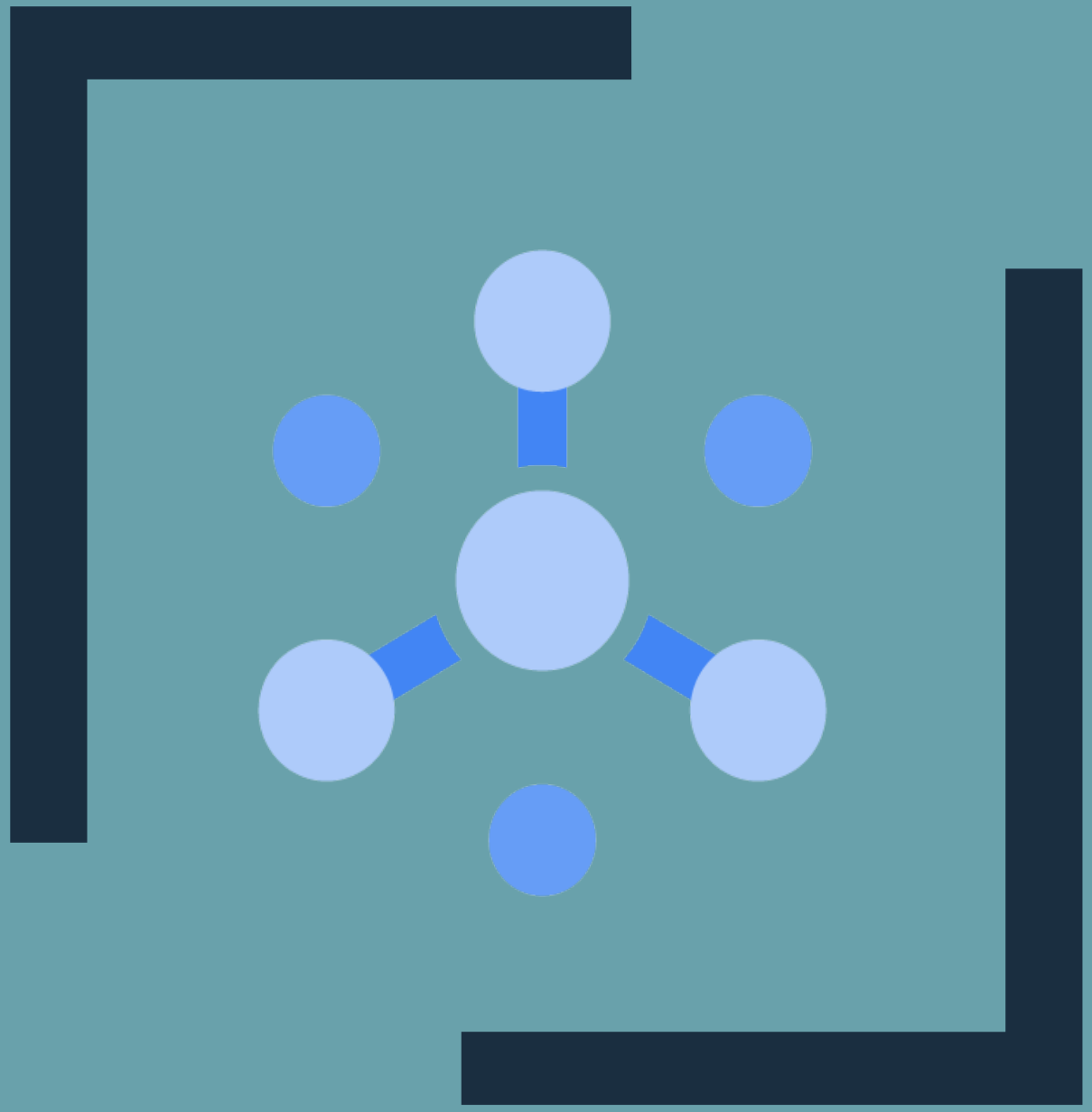

CLOUD PUB/SUB ON GCP: THE WHAT, WHYS AND HOWS

Karen Reeves

Connect Forward

December 2020

Let’s talk Pub/Sub

What is Pub/Sub Messaging

Definitions
Use Cases

Cloud Pub/Sub on GCP

Benefits
Publishers
Subscribers
What happens when things go wrong

Next Steps

https://kmr0018.github.io/ConnectForward-PubSubOnGCP/ @quiltndogs
karen_m_reeves@homedepot.com

Pub/Sub Messaging

- Asynchronous messaging pattern that decouples applications to increase reliability, performance, and scalability
- Any message sent by a publisher is immediately received by any subscribers to the topic.
- Used for Event driven microservice or serverless architectures

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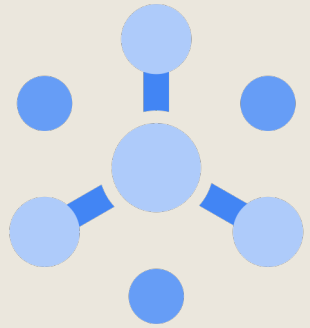
@quiltndogs karen_m_reeves@homedepot.com

Pub/Sub Terms



MESSAGE

THE UNIT OF DATA BEING SENT BY THE PUBLISHER

TOPIC

AN INTERMEDIARY CHANNEL THAT THE PUBLISHER POSTS TO. THE TOPIC HAS A LIST OF SUBSCRIPTIONS THAT IT PUBLISHES MESSAGES TO.

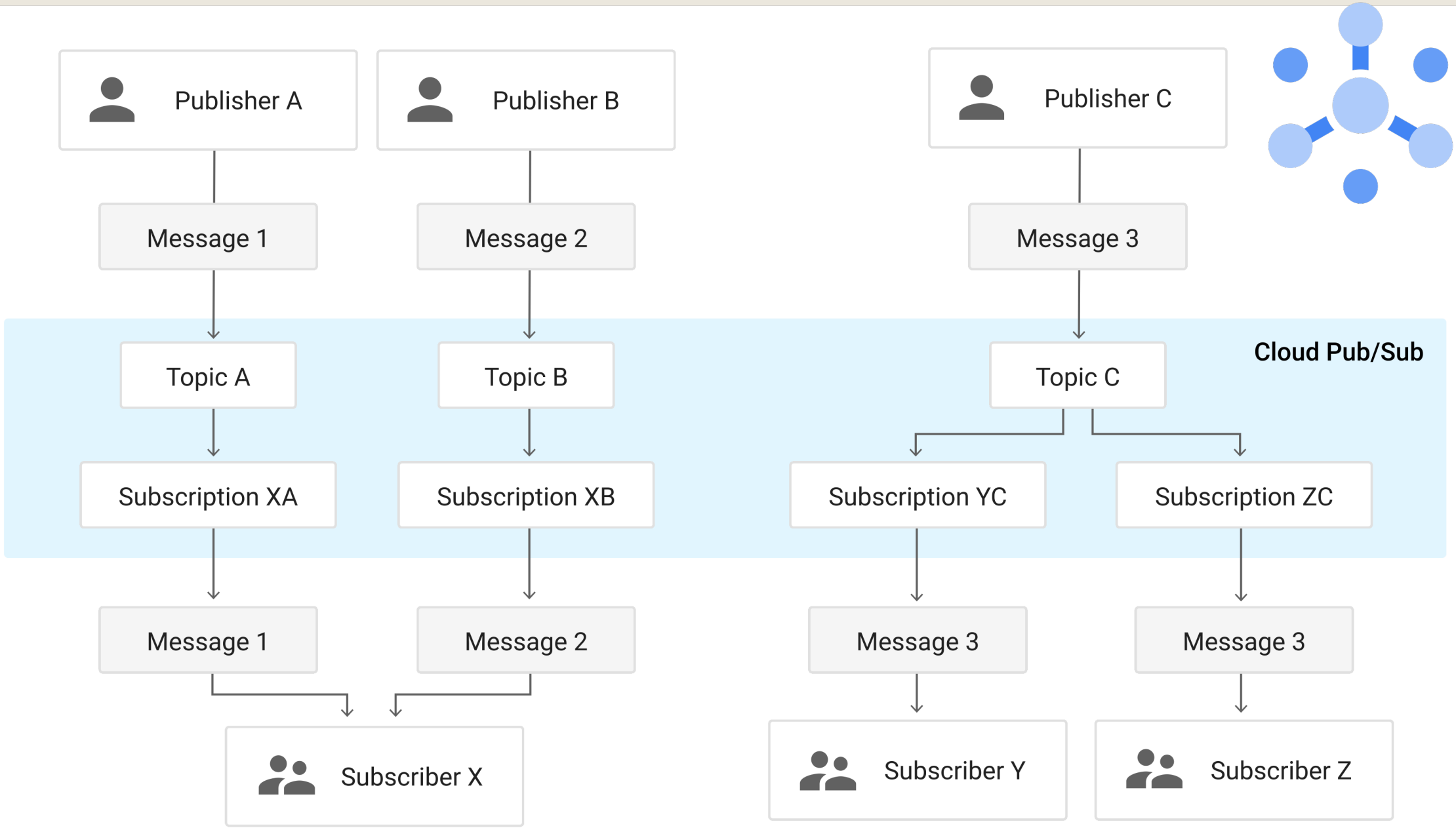
PUBLISHER

AN APPLICATION THAT SENDS MESSAGES TO TOPIC

SUBSCRIPTION

A QUEUE FROM EACH TOPIC. A TOPIC MAY HAVE MULTIPLE SUBSCRIPTIONS AND EVERY MESSAGE WILL BE SENT SIMULTANEOUSLY TO ALL SUBSCRIPTIONS.

SUBSCRIBER - AN APPLICATION THAT SUBSCRIBES TO A TOPIC VIA A SUBSCRIPTION TO RECEIVE MESSAGES PUBLISHED BY ANOTHER APPLICATION


Publisher A
Publisher B
Publisher C
Message 1
Message 2
Message 3
Cloud Pub/Sub
Topic A
Topic B
Topic C
Subscription XA
Subscription XB
Subscription YC
Subscription ZC
Message 1
Message 2
Message 3
Message 3
Subscriber X
Subscriber Y
Subscriber Z

Balancing workloads in network clusters

Implementing asynchronous workflows

Distributing event notifications

Refreshing distributed caches

Logging to multiple systems

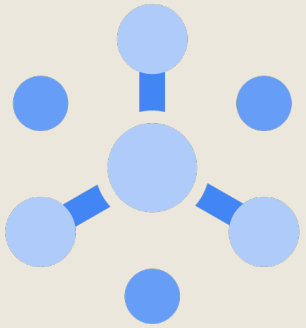
Data streaming from various processes or devices

Reliability improvement

Common use cases

https://cloud.google.com/pubsub/docs/overview

Google Cloud Pub/Sub



GUARANTEED AT LEAST ONCE DELIVERY

BEST EFFORT ORDERING

GLOBAL, LOAD BALANCED

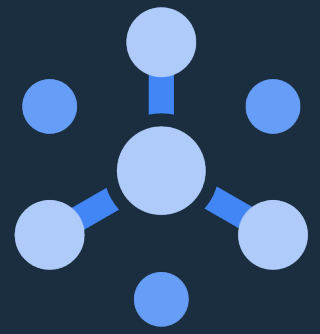
MESSAGES PERSISTED UNTIL THEY EXPIRE OR ARE ACKNOWLEDGED

CONFIGURABLE MESSAGE EXPIRATION

SETTING TO PERSIST ACKNOWLEDGED MESSAGES FOR SPECIFIED PERIOD

BUILT IN MONITORING

FORCED MESSAGE ORDERING



Publishing to a Topic

Publisher creates message

- Content
- Attributes
- Ordering Key

Send request to pub/sub server

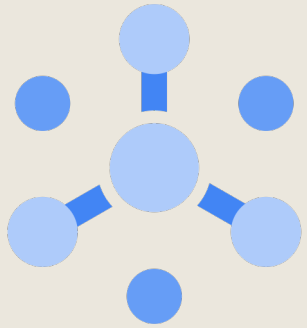
Pub/Sub publishes to topic

Pull

- Subscriber app sends request to Pub/Sub
- Pub/Sub sends message
- Subscriber acknowledges message
- Un-acknowledged messages will be resent until the configured acknowledge expiration is reached
- Pub/Sub removes message from queue when acknowledged or expired
- Allows flow control
- Good when throughput critical and large number of messages
- Good when Public HTTPS endpoint with non-self signed cert not feasible

Push

- Pub/Sub sends via webhook
- Subscriber responds with a HTTP response code.
- Any Non-Success response code will cause the message to be resent
- If Pub/Sub gets a success message it removes the message from the queue
- Good in environments where Google Credentials are not feasible to set up



Cloud Pub/Sub Subscriptions

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WHAT HAPPENS WHEN THINGS GO WRONG?

Like...

Message that can't be processed for some reason

Issue in the application so it isn't processing messages

Messages sent that don't need to be processed

Retry Policy

Retry Delay - initialRetryDelay

Exponential Retry Backoff – retryDelayMultiplier (Default 1.3)

Maximum Retry Interval – maxRetryDelay

Seek

Seek to Timestamp

Automatically Acknowledges all messages before timestamp set

Unacknowledges all messages after the timestamp

Requires setting to keep acknowledged messages to be on

Seek To Snapshot

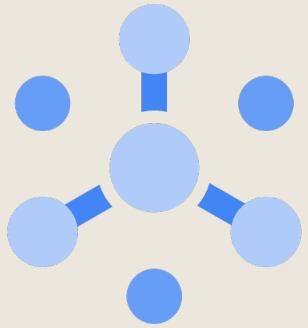
Create a snapshot

Will resend everything from the snapshot after

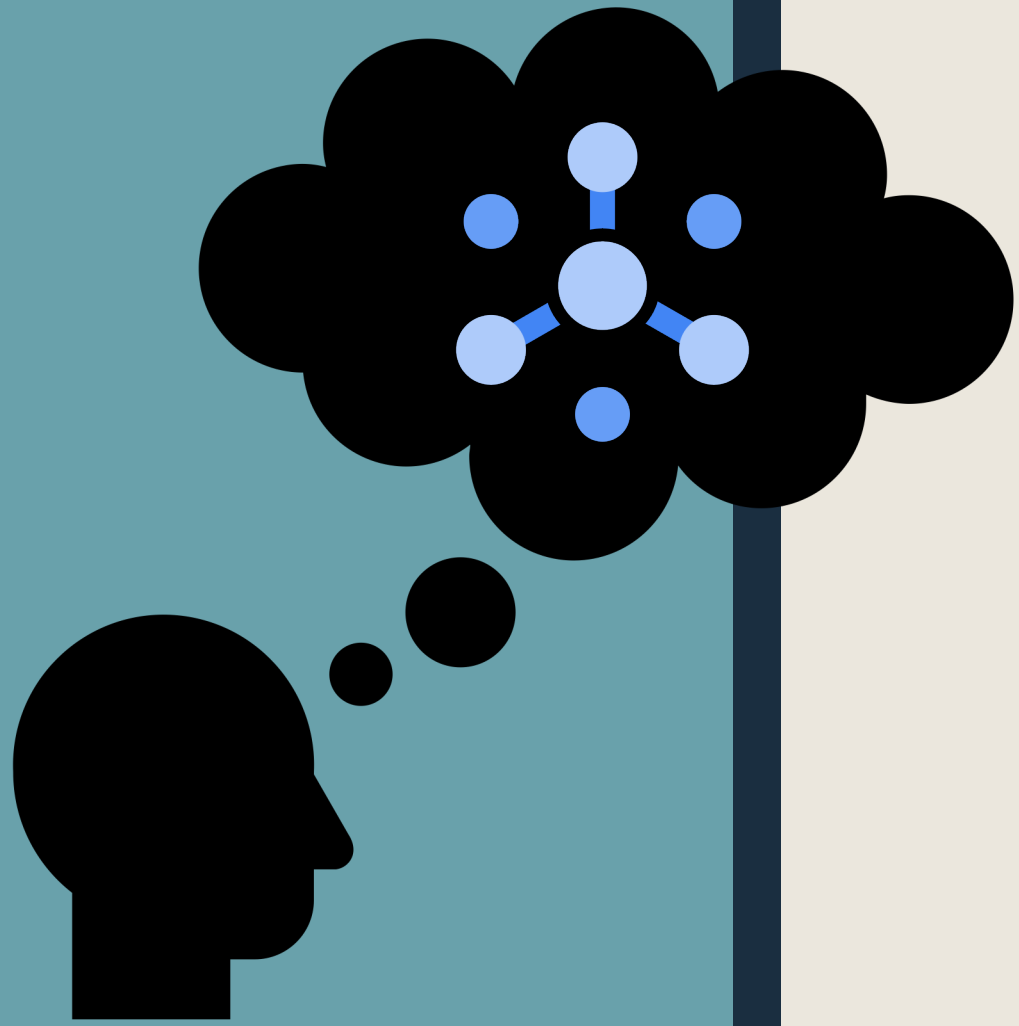
Does not require keeping acknowledged messages

Sometimes used after deployments

Dead Letter Queue



- Newer feature of pub/sub
- Configure delivery retry a message for a set number of times
- If message not acknowledged after retries sent to Dead Letter Queue
- Message removed from Subscription
- Stops using resources for messages that can’t be processed
- Allows processing by another method



What Now?

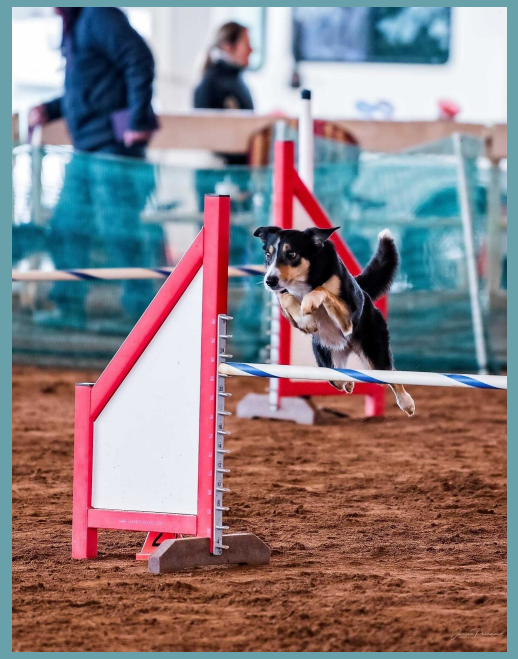
Check out Google's Docs

https://cloud.google.com/pubsub/docs/overview

https://cloud.google.com/pubsub/architecture

Create a GCP account and play

Pluralsight and Qwiklabs have some resources if you have access to them.



About Me

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Karen is a software engineer at Home Depot working on GCP, Java Microservices and React. She has 22 years experience in Java and Web Development. In her spare time she plays dog sports with her dogs and quilts, which explains her twitter and IG handle.

Resources

https://thenewstack.io/publish-subscribe-introduction-to-scalable-messaging/

https://cloud.google.com/pubsub/docs/overview

https://cloud.google.com/pubsub/architecture

https://aws.amazon.com/pub-sub-messaging/

https://blog.stackpath.com/pub-sub/