SCALE WITH **NSQ**

a realtime distributed messaging platform

@GeorgiCodes

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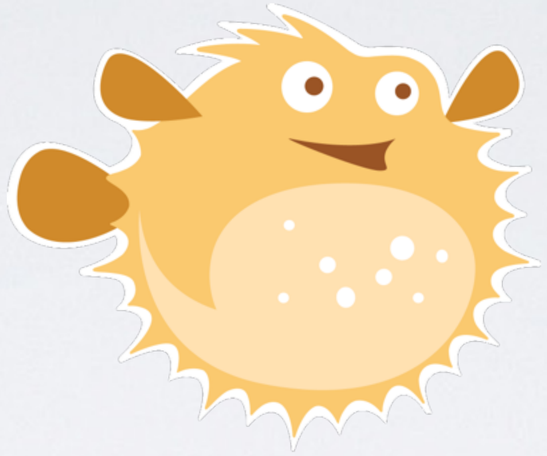

G'DAY, MY NAME IS GEORGI

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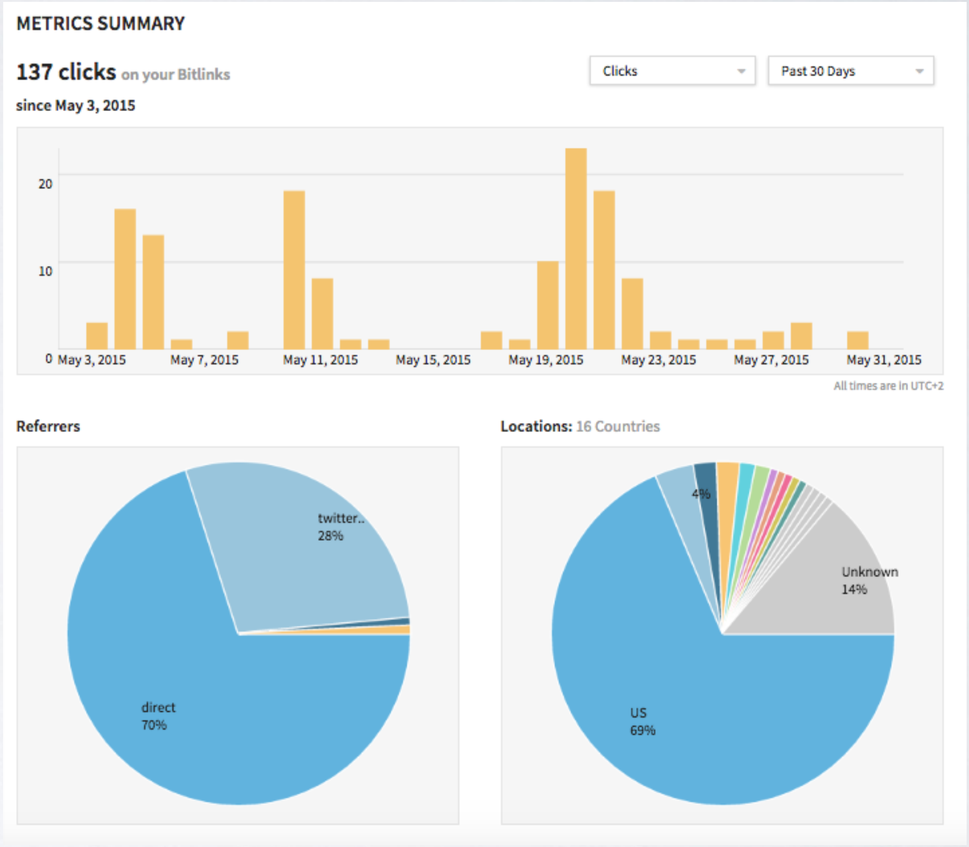
WHAT IS **BITLY**?

- Popular URL shortener
- analytics around **how** and **where** those links were shared
- **10 billion** clicks per month
- **8000** requests per second



WHAT IS **NSQ**?

- At version: 0.3.5
- Open-sourced by Bitly
- written in Go
- 19 client libraries, 11 languages
- > 3 years in production

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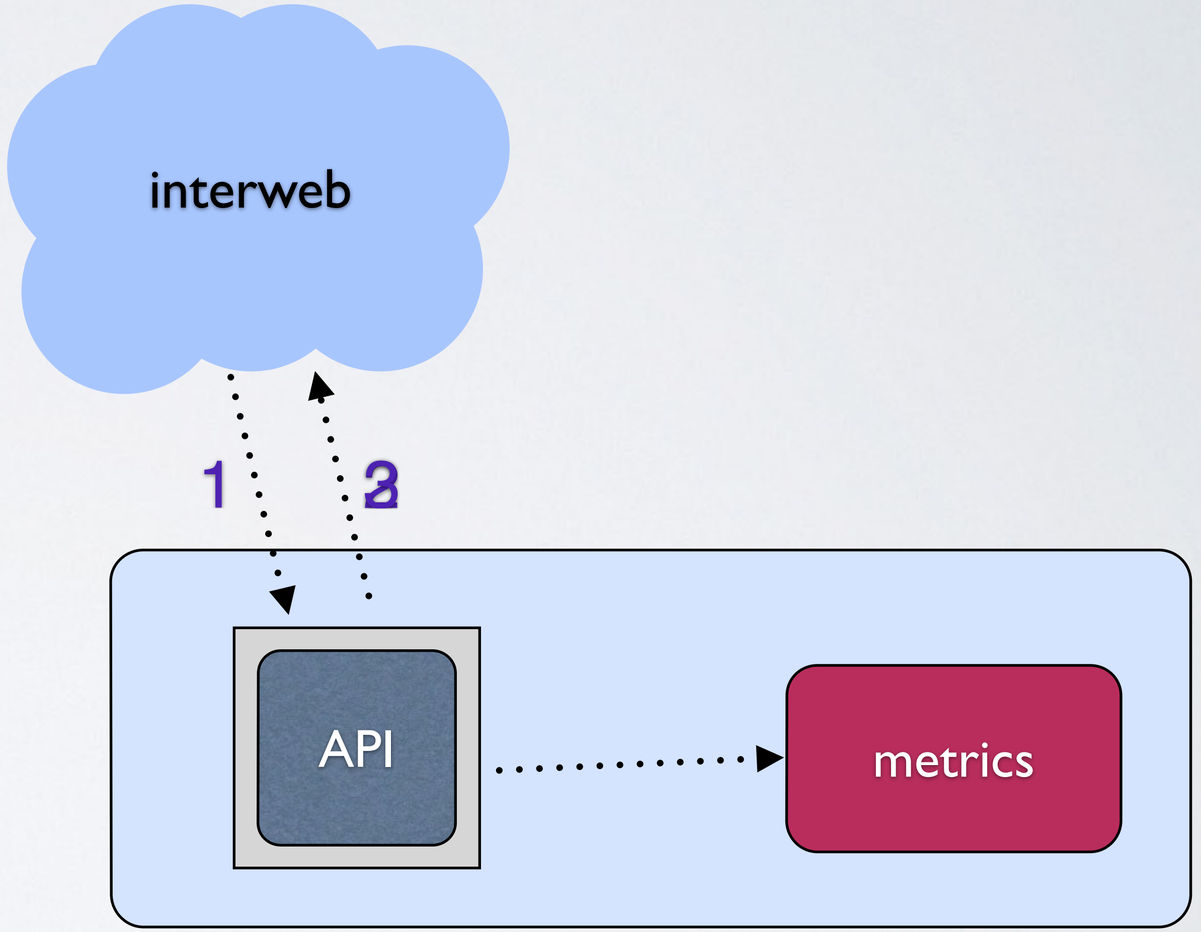
GROWING PAINS

- **single** host
- **synchronous** writes
- new feature: **track metrics**



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MESSAGING PATTERNS

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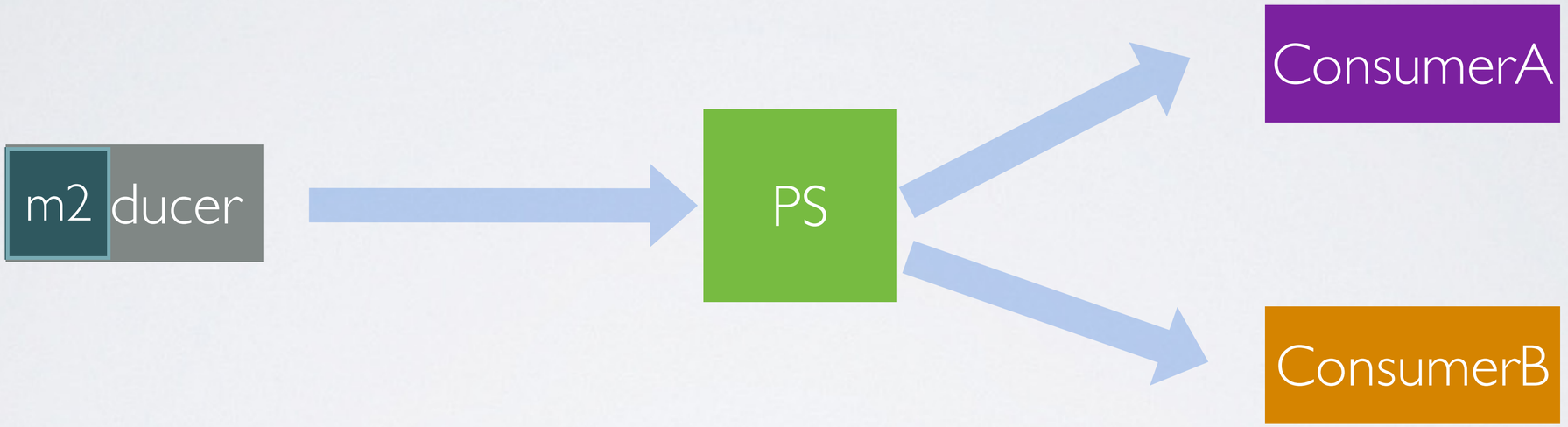
BROADCAST



de-coupling of producers and consumers

multicast: message copied and delivered to n consumers

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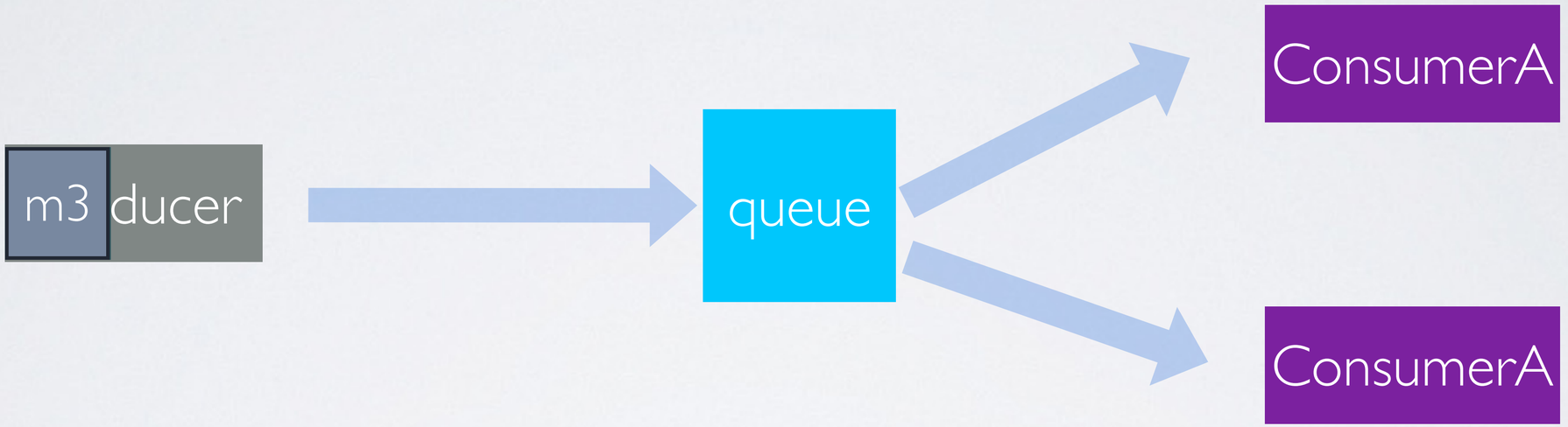
DISTRIBUTION



horizontal scalability

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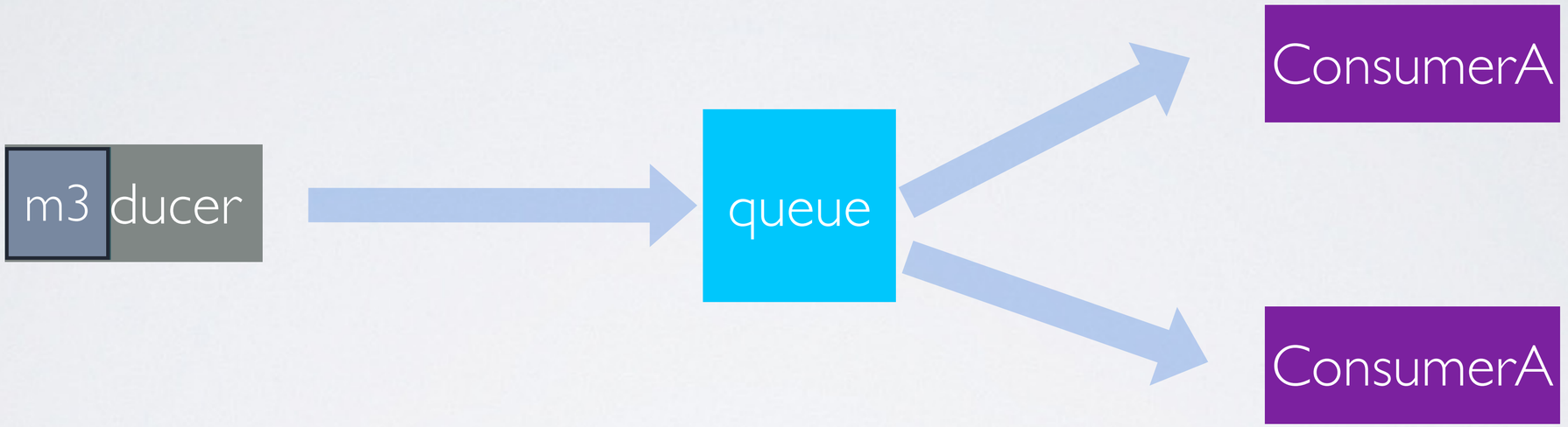
FAILURE



fault tolerance

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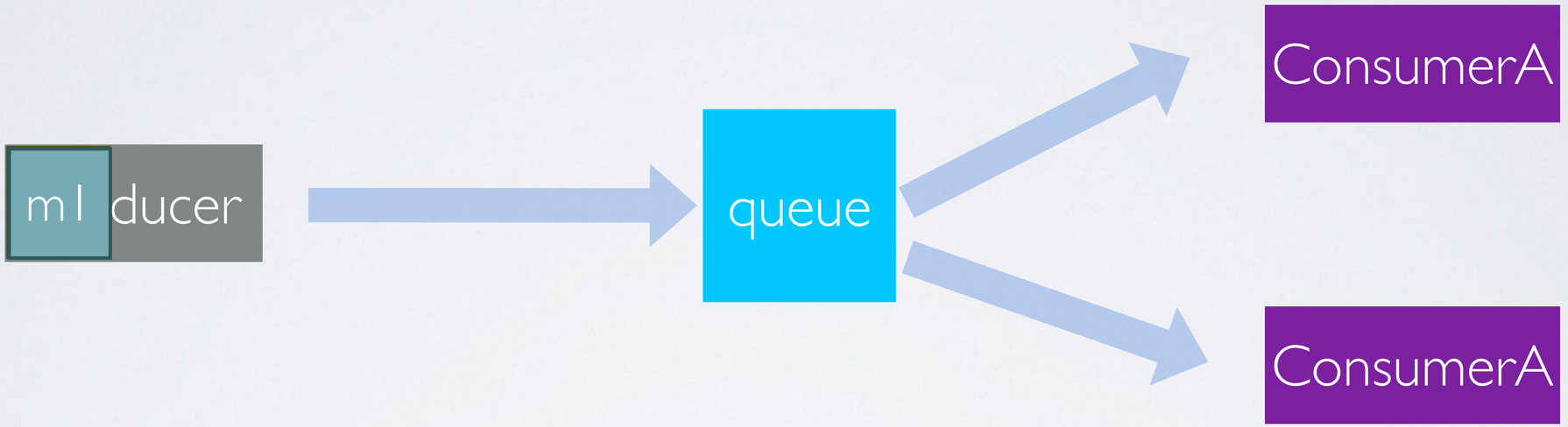
EVEN MORE FAILURE



when *all the things* fail

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NSQD

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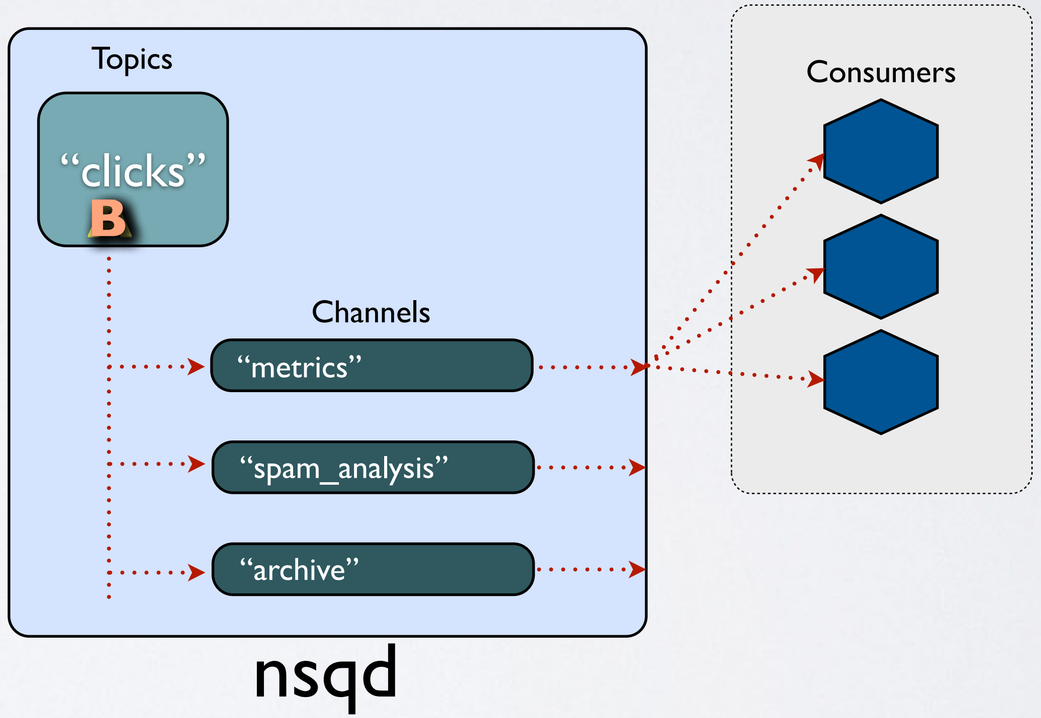
TOPICS AND CHANNELS

combine pubsub, distribution, and queueing

- a **topic** is a distinct stream of messages
- a **topic** has one or more **channels**
- topics and channels are created at **runtime**
- messages are **pushed** to consumers



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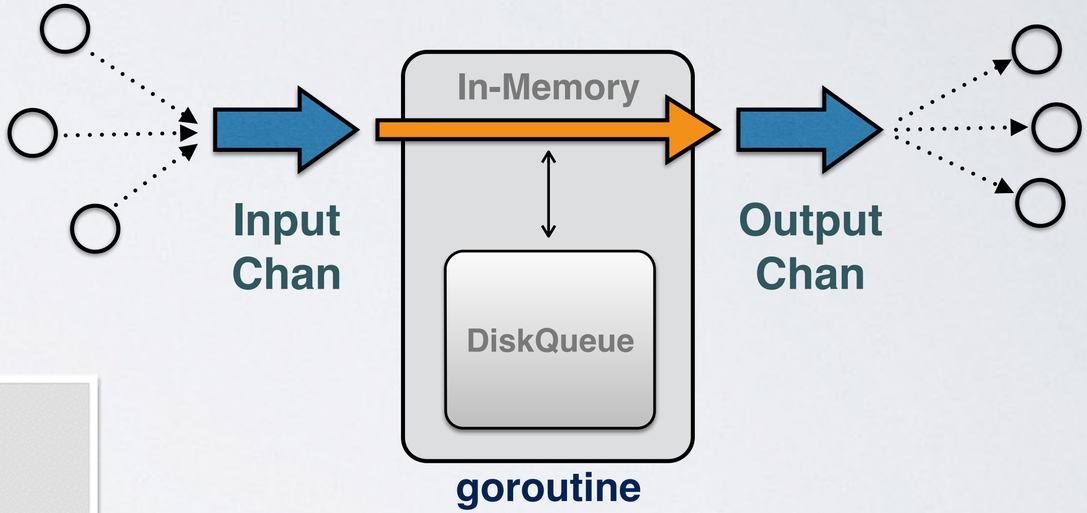
UNDER THE HOOD

- **topics** and **channels** are *independent*
- configurable high water mark (disk persistence)




```
for msg := range c.incomingMsgChan {
    select {
    case c.memoryMsgChan <- msg:
    default:
        err := WriteMessageToBackend(&msgBuf, msg, c)
        if err != nil {
            // log whatever
        }
    }
}
```

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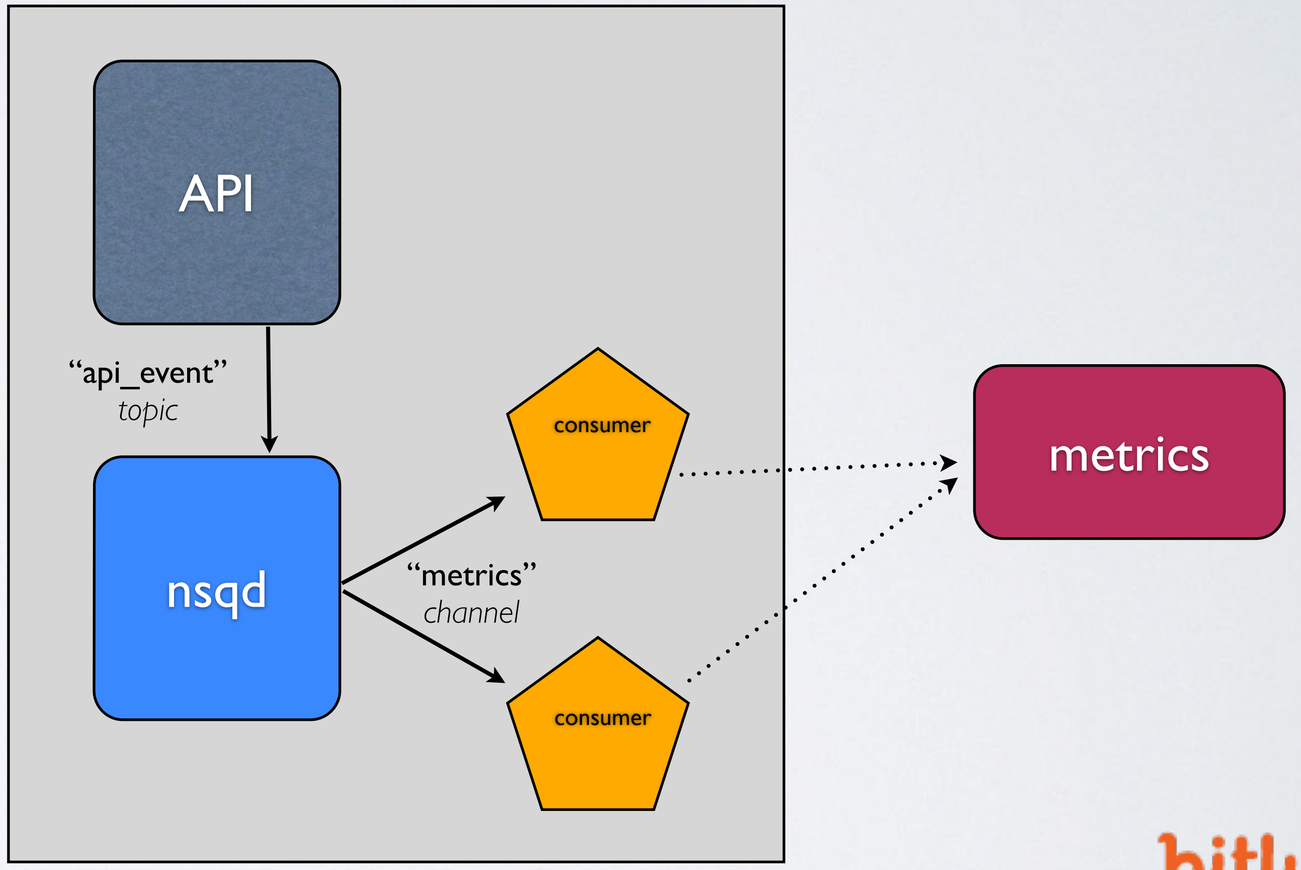
OUR SIMPLE EXAMPLE + NSQD

- introduce **nsqd**
- **de-coupled** production and consumption of data
- PUB locally to **nsqd** via HTTP
- perform work **async**
- co-locate everything (**silo**)



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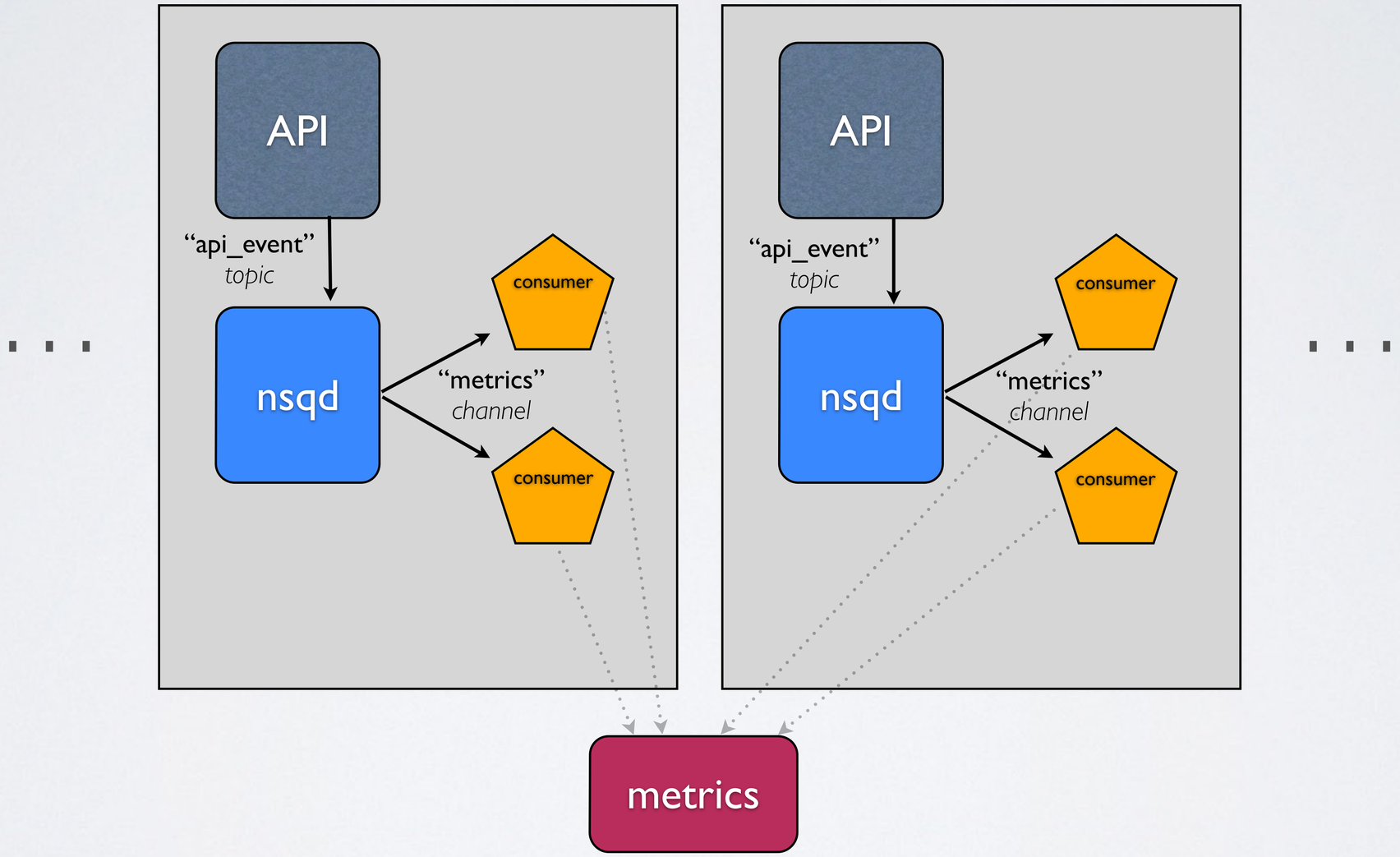
SCALE HORIZONTALLY



NSQLOOKUPD

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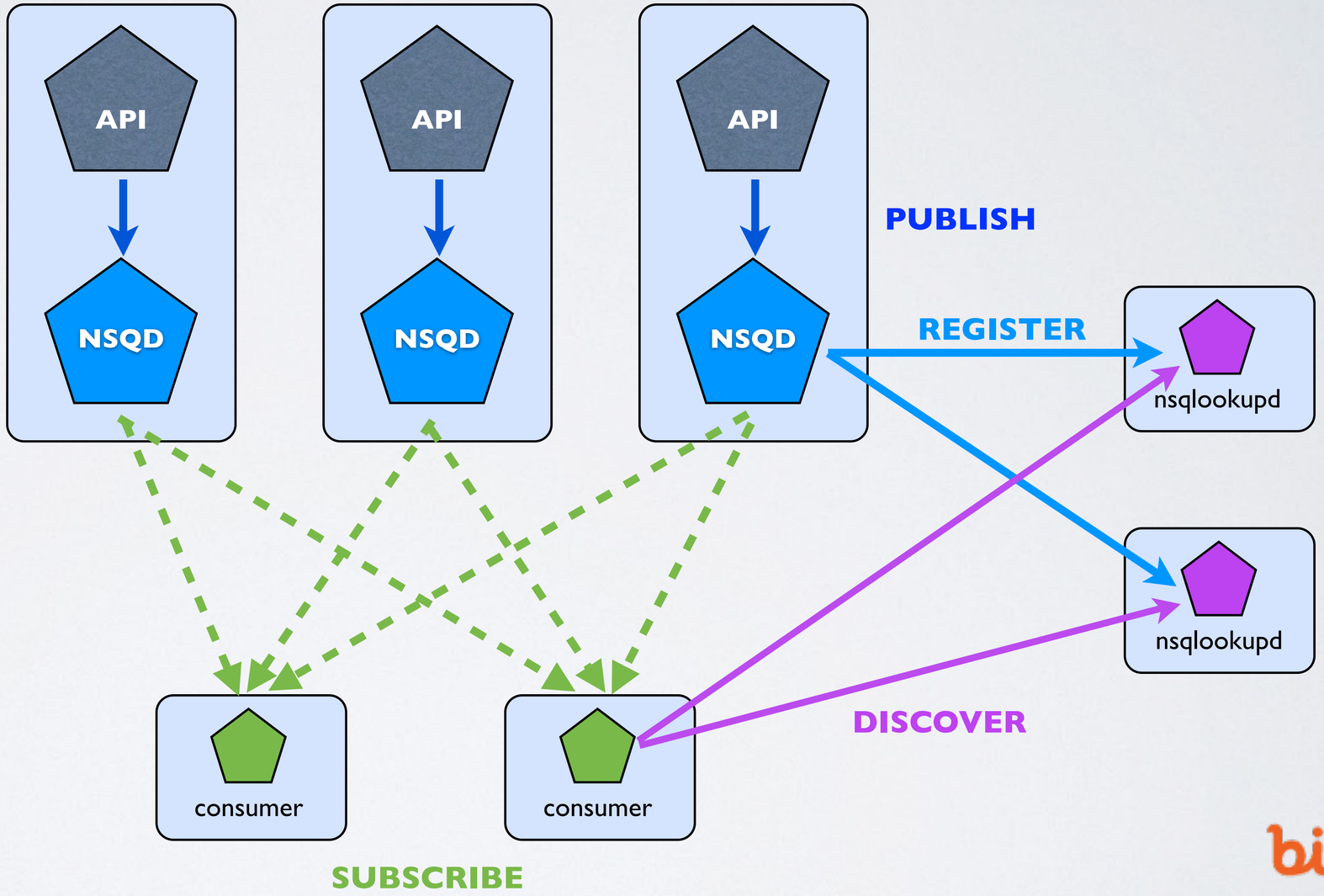
TYPICAL NSQ CLUSTER

- enable *distributed* and *decentralized* topologies
- no centralized broker
- **nsqlookupd** instances are *independent* (**no coordinatation**)



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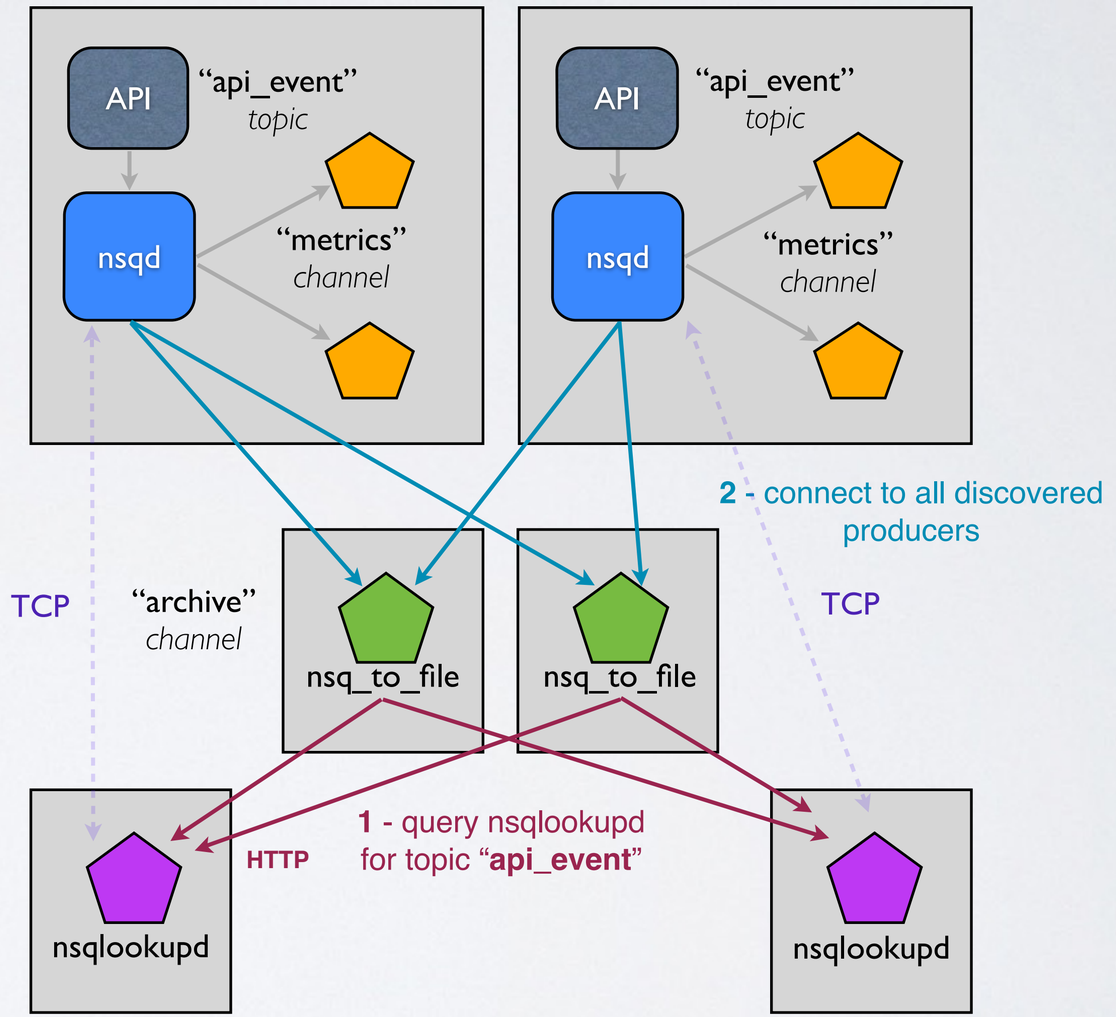
OUR SIMPLE EXAMPLE + NSQLOOKUPD

- introduce **nsqlookupd**
- **discoverability**
- producers and consumers *come* and *go*
- other services can *discover* and *subscribe* to this topic



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GUARANTEES

- messages are delivered *at least* once
- messages are *not* durable (by default)
- messages received are *un-ordered*
- consumers *eventually* find all topic producers

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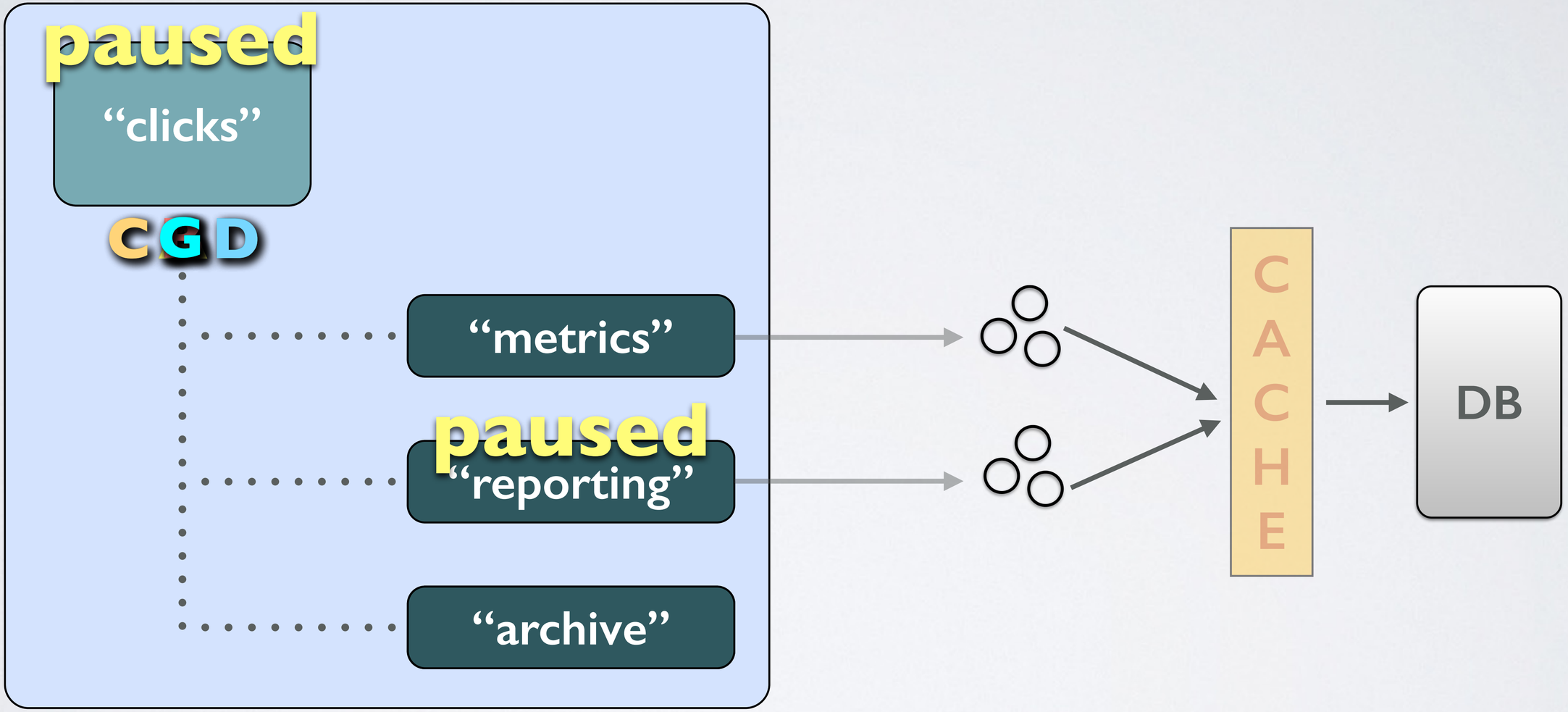
TOPIC & CHANNEL PAUSING



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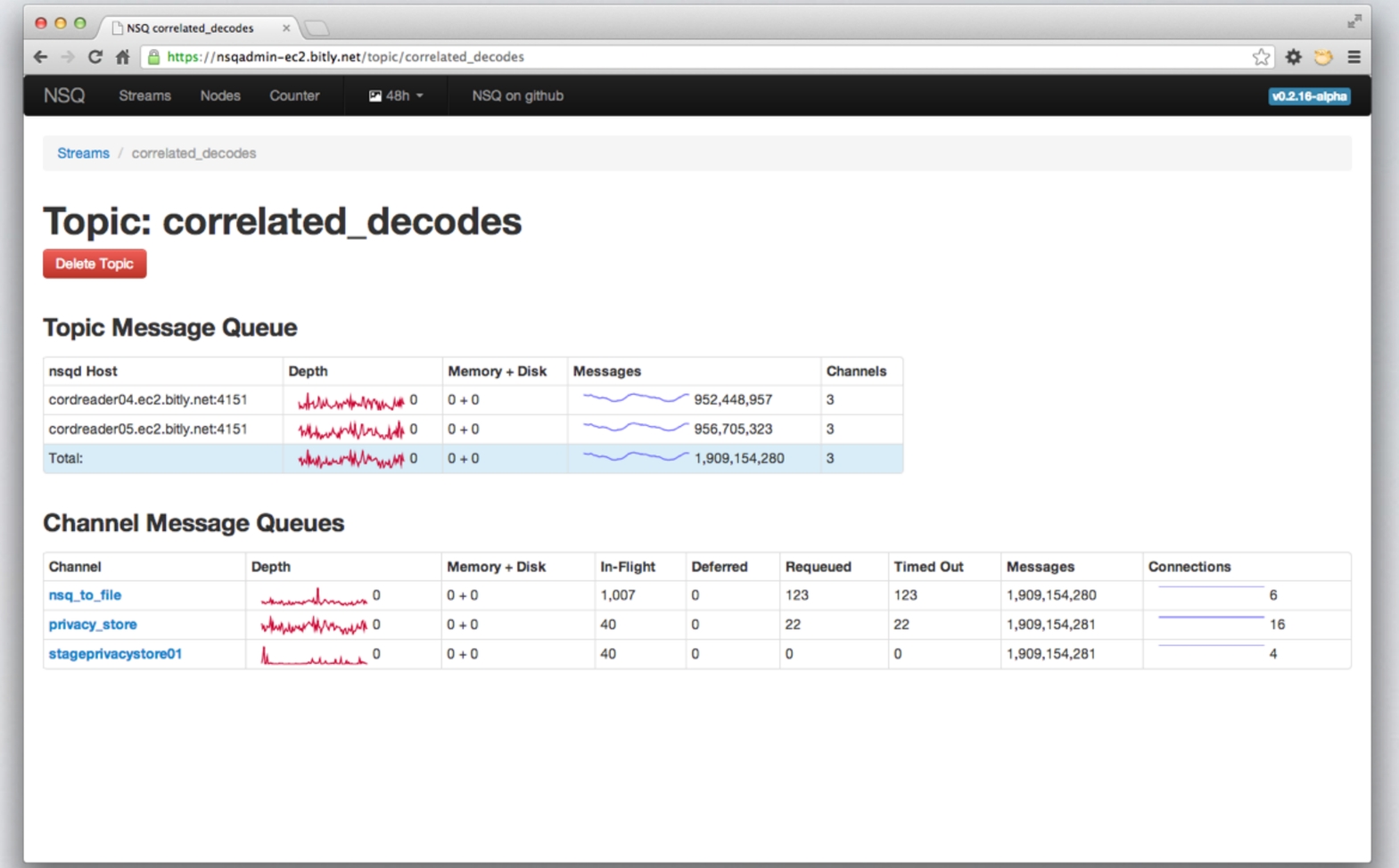
NSQ ADMIN

- **#ephemeral** channels



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THANK-YOU!

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big thanks to ***@jehiah*** *and* ***@imsnakes***
(authors of NSQ)

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