Build a High-Performance Microservices Architecture with NATS.io & Golang

Uri Shamay
Juno (Gett)

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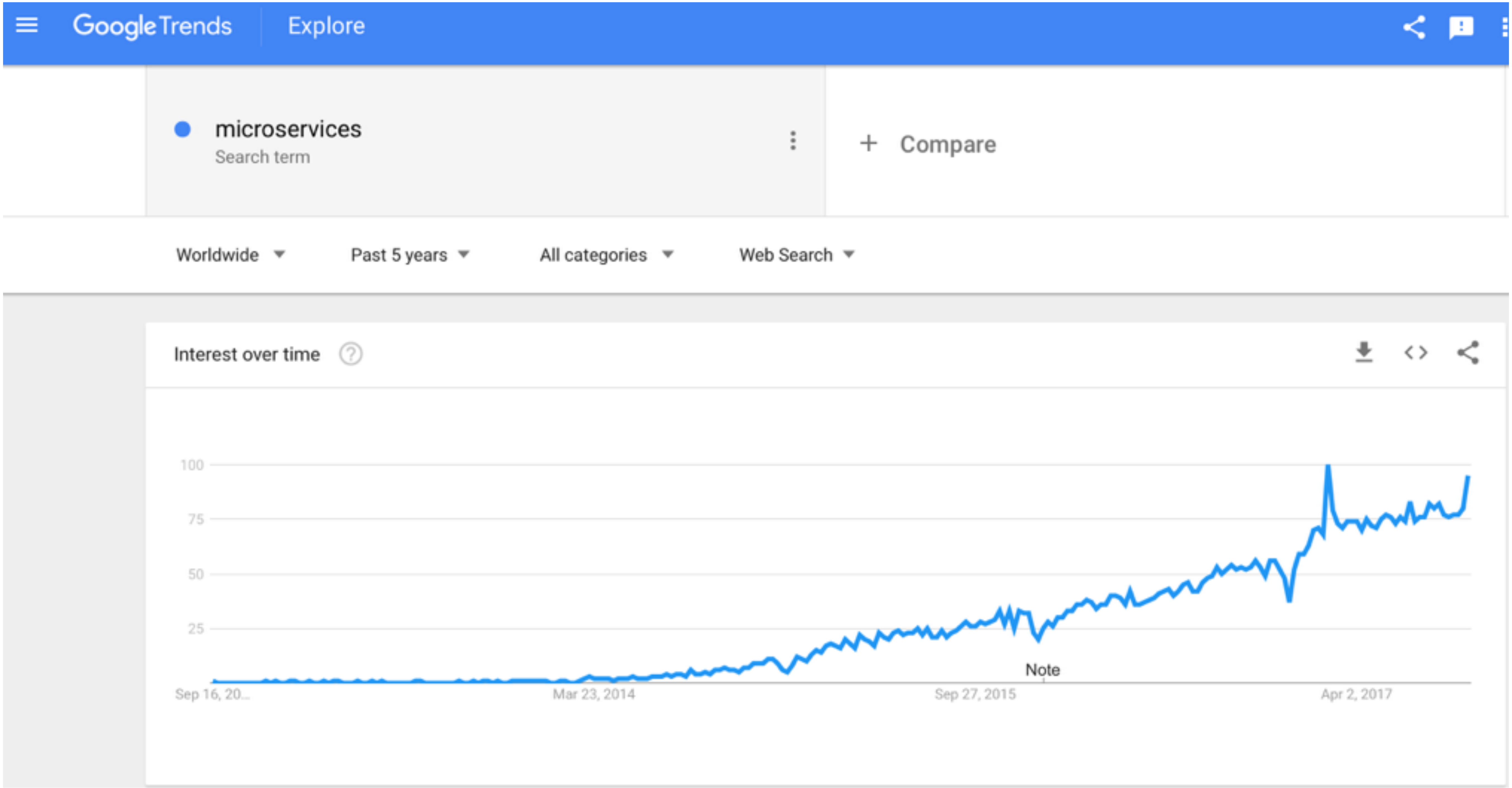
Microservices Trend



microservices
Search term

Worldwide ▾ Past 5 years ▾ All categories ▾ Web Search ▾

Why Go is built for high scalability?

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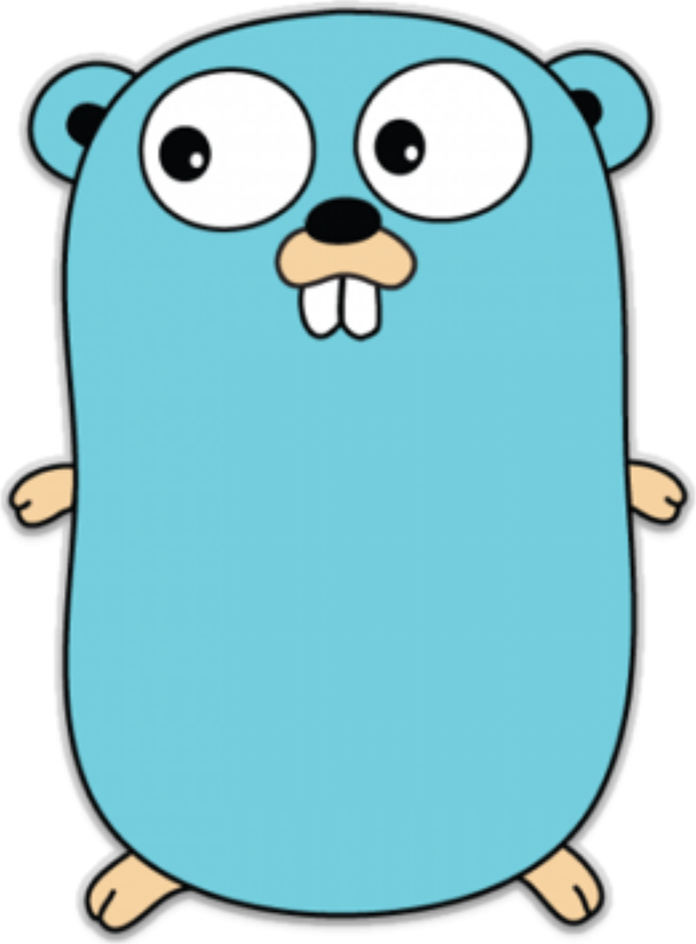


Golang

- Synchronous Programming Model
- Highly Scale Concurrency

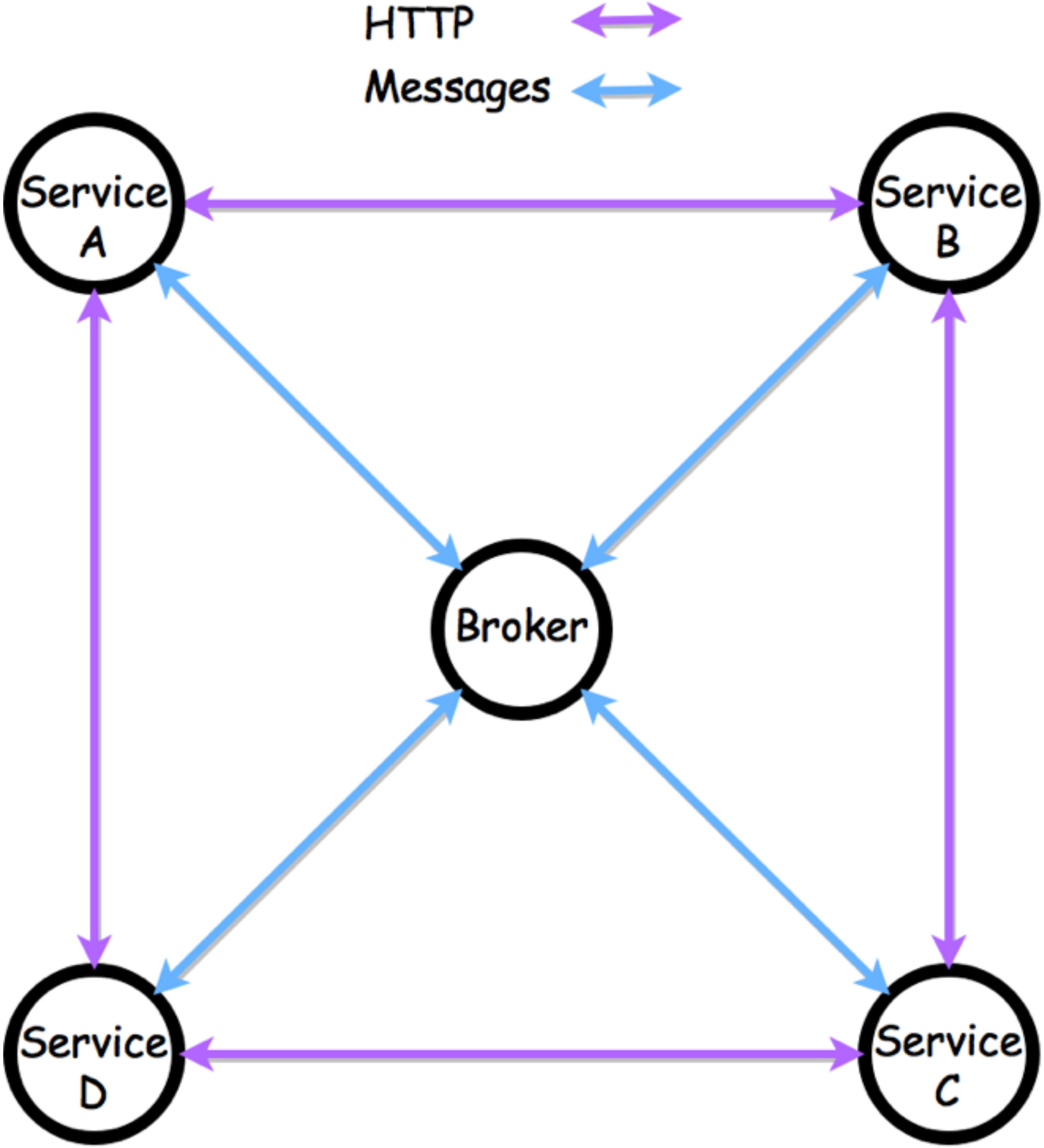
Http Upload Server

```
// handler == new goroutine
func upload(w Response, r *Request){
  // NO caLLbACK HeLL!(^O^)
  io.Copy(IO.out, r.Body)
}

func main() {
  http.HandleFunc("/upload", upload)
  http.ListenAndServe(":8080", nil)
}
```

Get Fastest Result

```
func GetFastestResult() (string, error) {
  c := make(chan string, 3)
  timeout := time.After(time.Second)

  go func() { c <- DoGet("SERVICE_1") }()
  go func() { c <- DoGet("SERVICE_2") }()
  go func() { c <- DoGet("SERVICE_3") }()

  select {
  case result := <-c:
    return result, nil
  case <-timeout:
    return nil, errors.New(“timeout”)
  }
}
```

Microservices Architecture


HTTP
Messages
Service A
Service B
Broker
Service D
Service C

NATS

high performance open source messaging system

NATS

- 10M/sec
- In-Memory - no persistence
- Broker based

NATS

- Pub/Sub - broadcast
- Request/Response - unicast

NATS Examples - Broadcast

```
 nats.
  Subscribe(
     “ms_geo_UpdatePoint”,
         msg) {
    // message received
})

nats.
 Publish(“ms_geo_UpdatePoint”,msg)
```

NATS Examples - Unicast

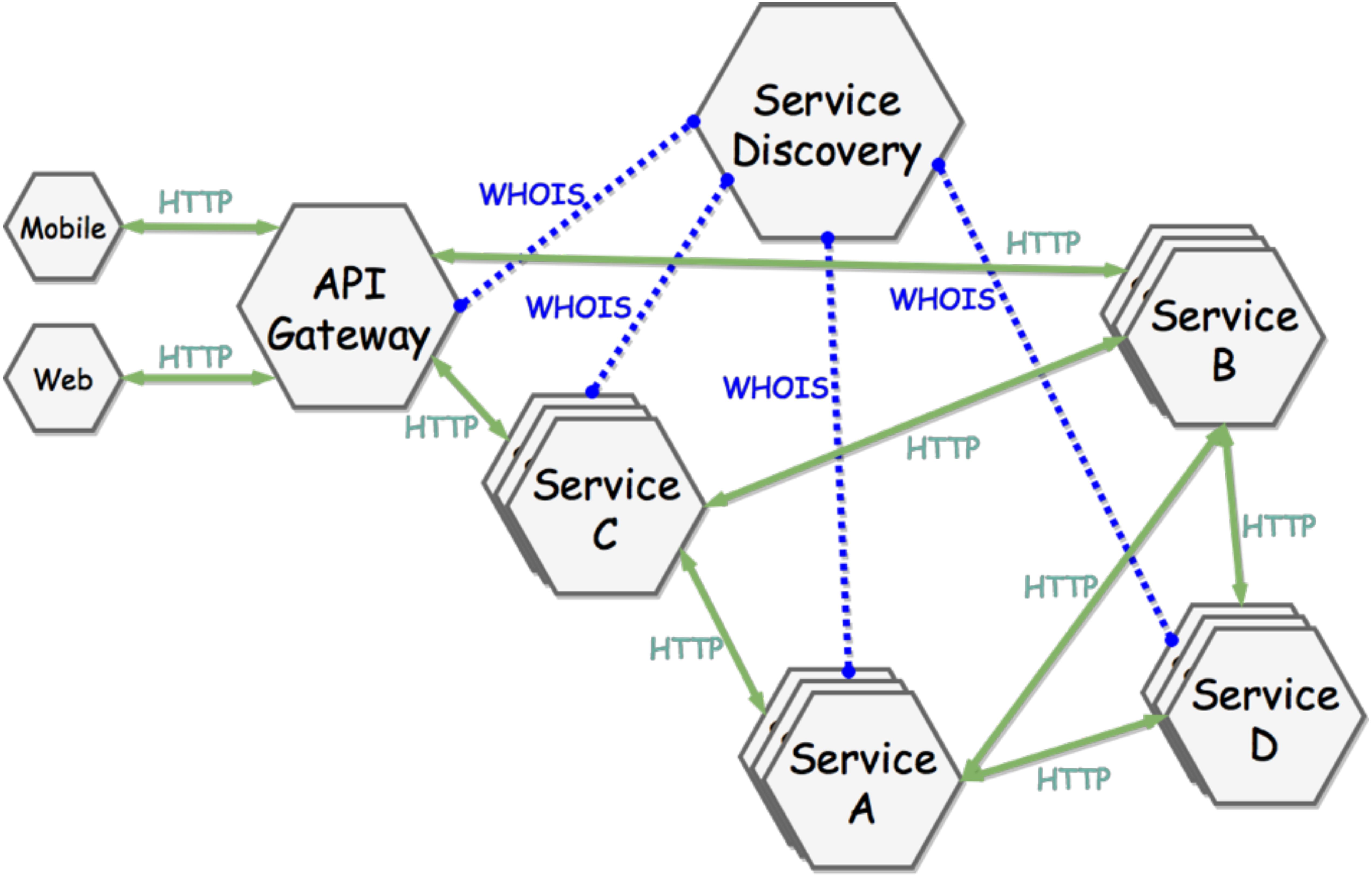
```
nats.
  QueueSubscribe(
     “ms_users_GetUser”,
         msg){
      ...
      return reply
})

response :=
   Request(“ms_users_GetUser”,msg)
```

HTTP vs NATS

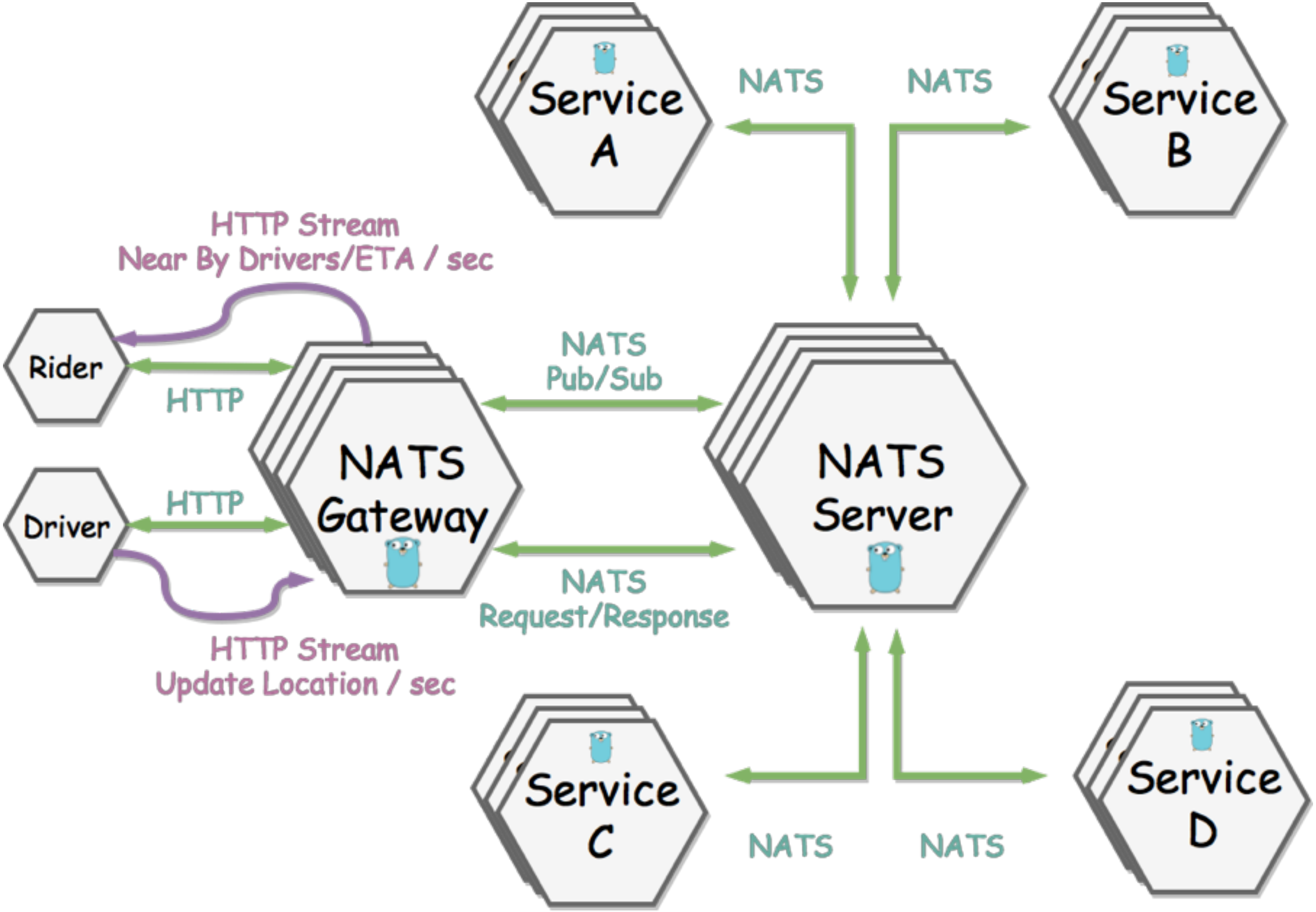
HTTP vs NATS

HTTP	NATS
Service Discovery	~~Service Discovery~~
Load Balancing	~~Load Balancing~~
Unicast	Unicast & Broadcast

Microservices - HTTP



Microservices - NATS



pitfalls

- !Persistence ¯_(ツ)_/¯
- Golang young ecosystem
- NATS timeouts

“Standing on the shoulders of giants”

Q & A