Introducing to Microservice using Moleculer Framework

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Before We Start

- Goal
  - You will understand what microservice is/is not
  - You know how microservice works
  - You can implement minimal microservice using moleculer.js
- Non Goal
  - Building enterprise application

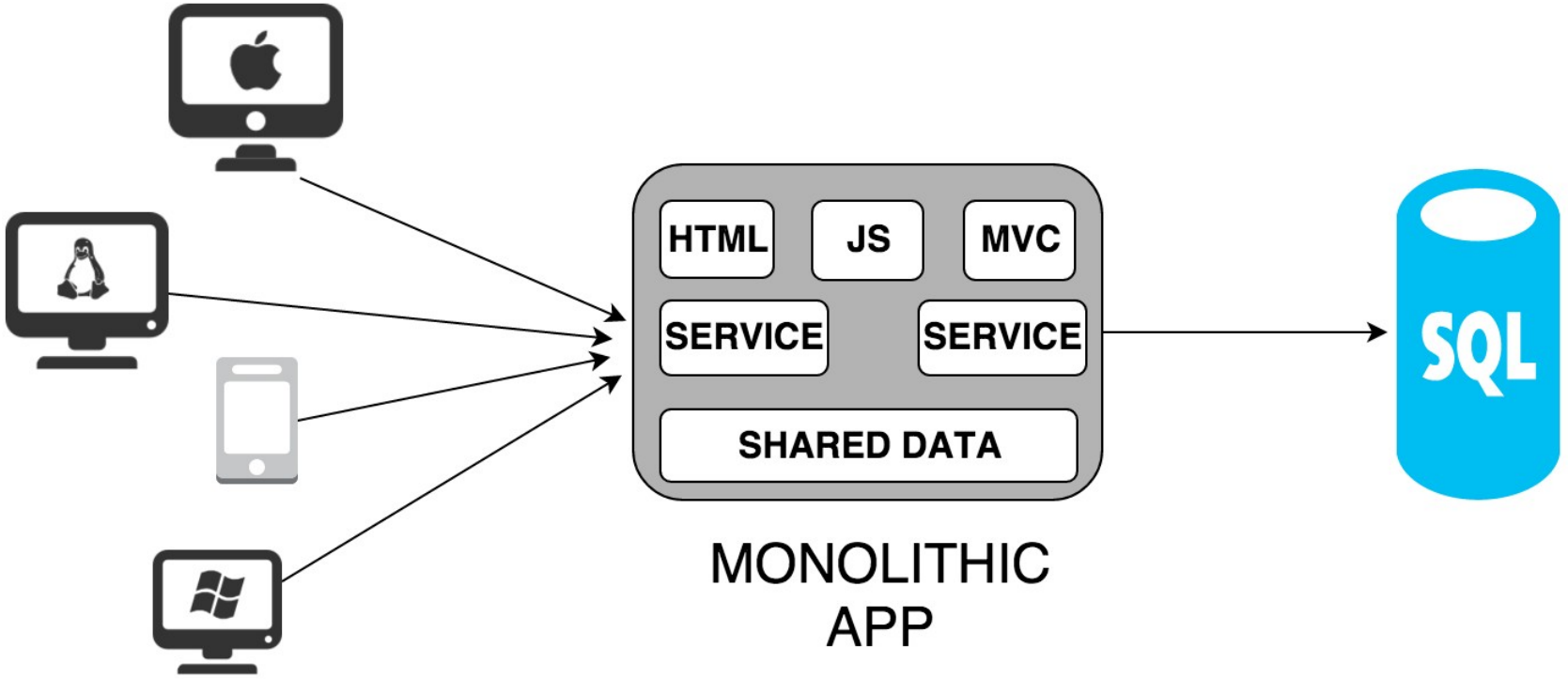
Architecture

Monolithic vs Microservice

Architecture

Monolithic vs Microservice

Architecture (Monolithic)



Monolithic

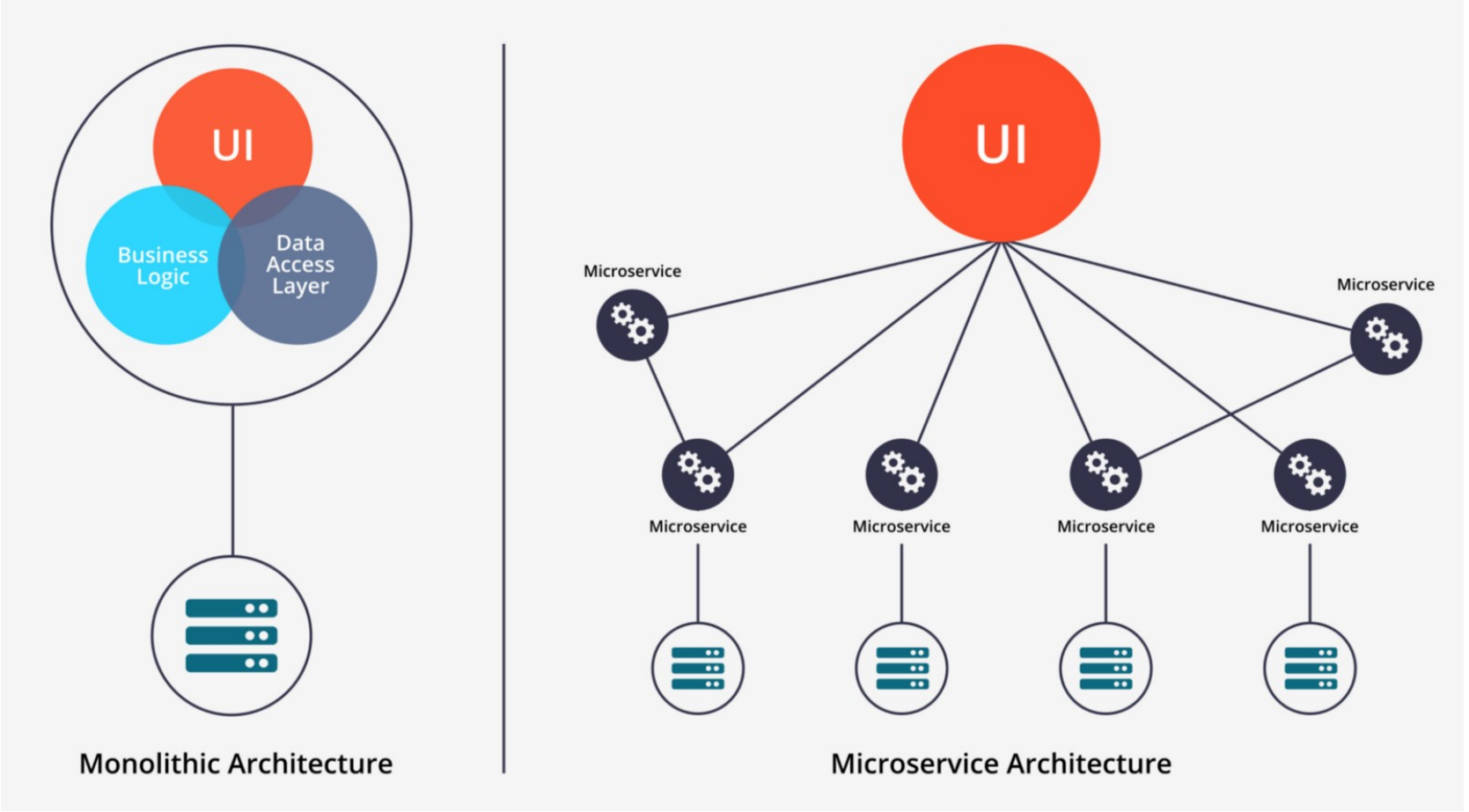
Pros

- Easy to develop
- Easy to deploy
- Easy to debug

Cons

- Not Scalable
- Tightly coupled

Architecture (Microservice)



Microservice

Pros

- Scalable
- Independent

Cons

- Difficult to develop
- Difficult to deploy
- Difficult to debug

Monolithic vs Microservice
Which one is Better?

Monolithic vs Microservice
Which one is Better?

It’s depend

Monolithic vs Microservice

Best-cases

Monolithic

- Few users
- Single fighter
- Shared hosting

Microservice

- A lot of users
- Teams of remote workers
- PaaS / IaaS

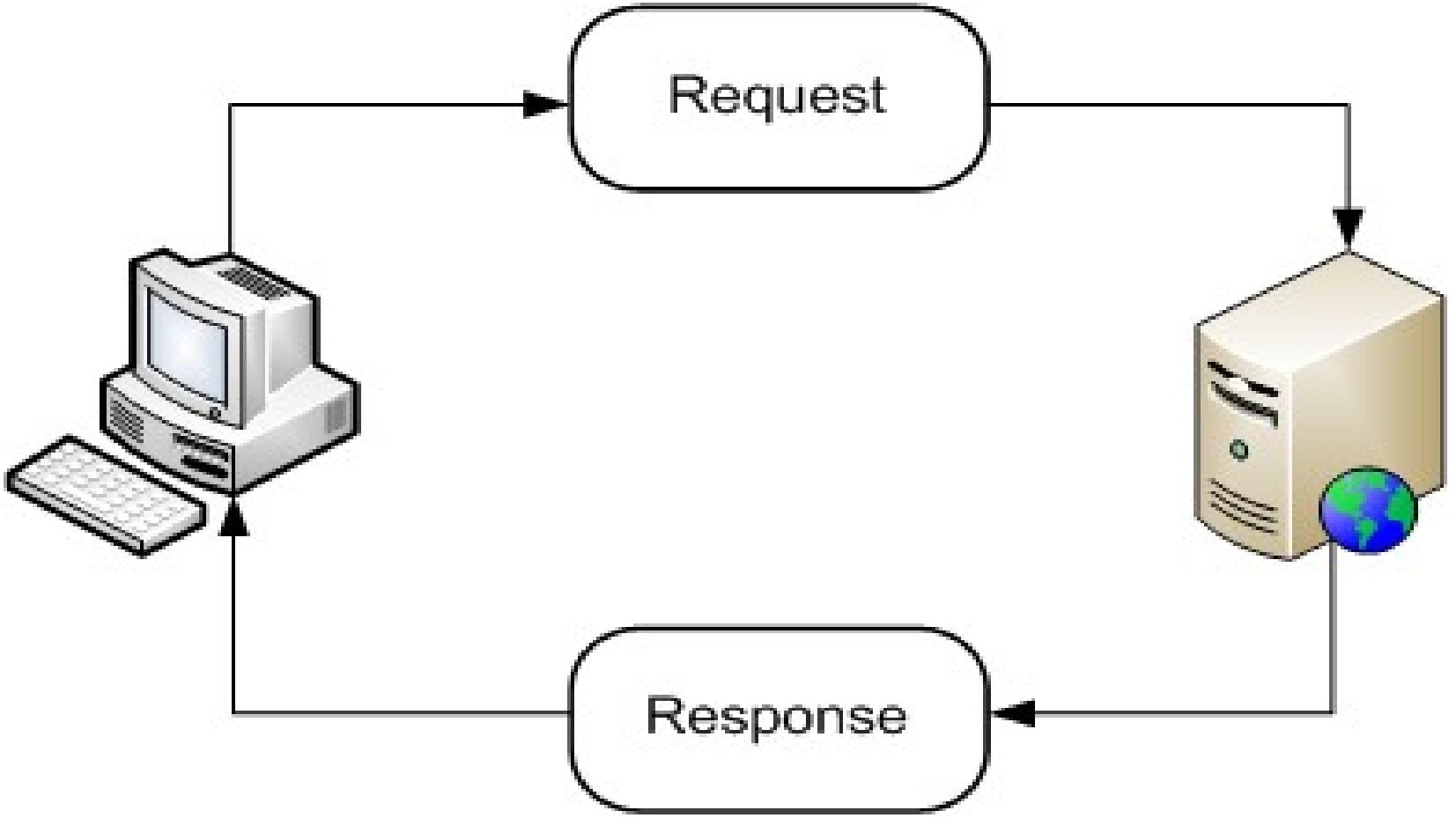
Communication

Pub/Sub vs Client/Server

Communication

Req/Res vs Pub/Sub

Req/Res
Request/Response



Req/Res

```
curl http://localhost:3000
```

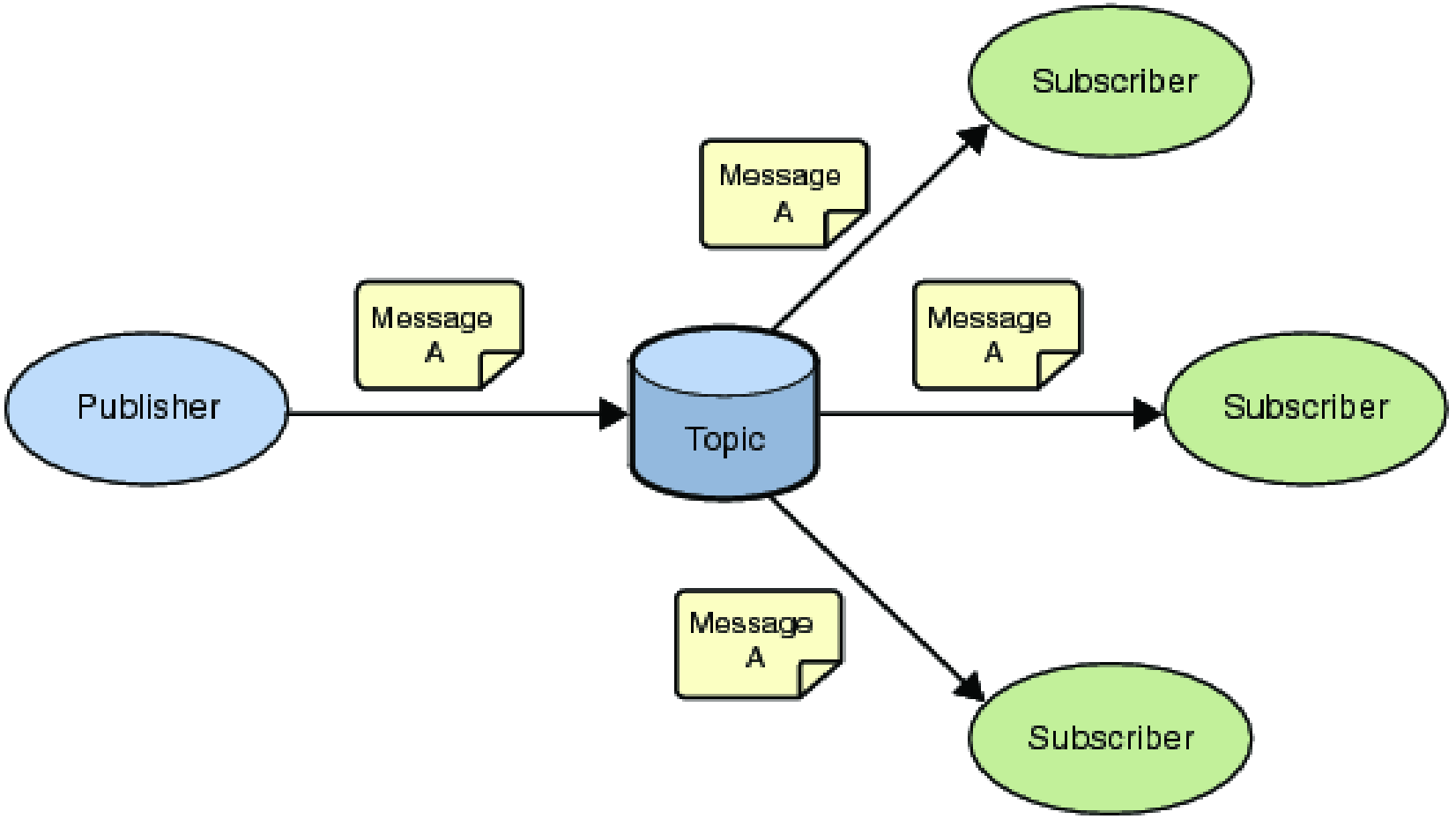
Client

```
const express = require('express');
const app = express();

app.get('/', function(req, res){
    res.send("Hello world!");
});

app.listen(3000);
```

Server

Pub/Sub

Publish/Subscribe



Pub/Sub

```
const NATS = require('nats');
const nats = NATS.connect();

// Simple Publisher
nats.publish('foo', 'Hello World!');
```

Publisher

```
const NATS = require('nats');
const nats = NATS.connect();

// Simple Subscriber
nats.subscribe('foo', function(msg) {
  console.log('Received a message: ' + msg);
});
```

Subscribers

```
const NATS = require('nats');
const nats = NATS.connect();

// Another Simple Subscriber
nats.subscribe('foo', function(msg) {
  console.log('Got: ' + msg);
});
```

Req/Res vs Pub/Sub
Best-cases

Req/Res

- Immediate response
- Tight coupled services
- Single Listener

Pub/Sub

- No response needed
- Independent services
- Multiple Listeners

Moleculer

Progressive microservices framework for Node.js.

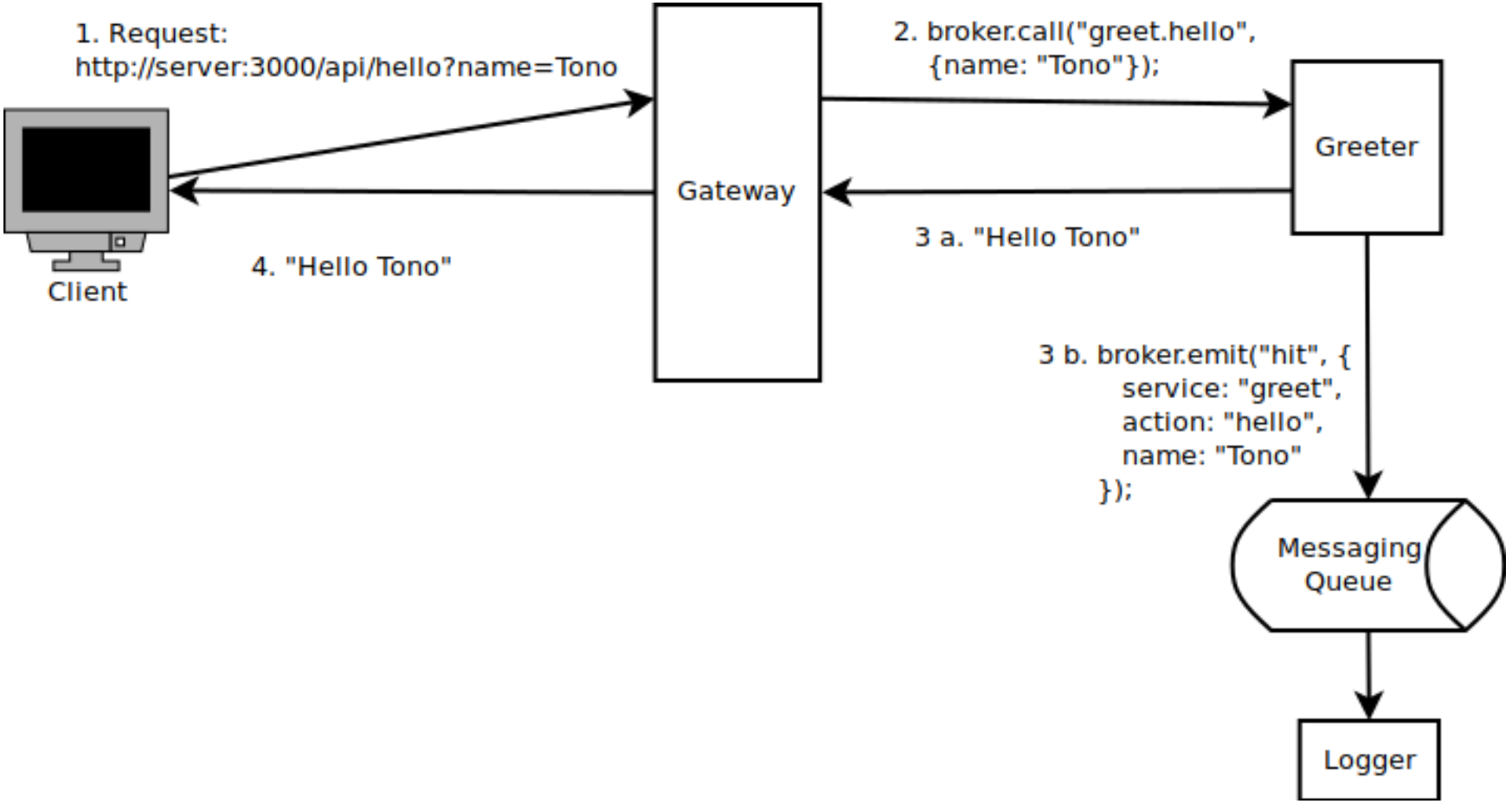
Moleculer Service Broker

- Create Service
  - broker.createService(serviceConfig);
- Start
  - broker.start();
- Req/Res
  - await broker.call(“service.action”, payload);
- Publish
  - broker.emit(event, payload);

Let’s Make It

Gateway → Greeter → Logger

The Blue Print



Gateway

```
const { ServiceBroker } = require("moleculer");
const ApiService = require("moleculer-web");

const broker = new ServiceBroker({
    transporter: "nats://0.0.0.0:4222",
});

broker.createService({
    mixins: [ApiService],
    settings: {
        port: 3000,
    },
    name: "api",
    actions: {
        async hello(ctx) {
            return await broker.call("greet.hello", {name: ctx.params.name});
        }
    }
});

broker.start();
```

Greeter

```
const { ServiceBroker } = require("moleculer");

const broker = new ServiceBroker({
    transporter: "nats://0.0.0.0:4222",
});

broker.createService({
    name: "greet",
    actions: {
        hello(ctx) {
            broker.emit("hit", {
                service: "greet",
                action: "hello",
                name: ctx.params.name,
            });
            return "Hello " + ctx.params.name;
        }
    }
});

broker.start();
```

Logger

```
const { ServiceBroker } = require("moleculer");

const broker = new ServiceBroker({
    transporter: "nats://0.0.0.0:4222",
});

broker.createService({
    name: "log",
    events: {
        "hit": {
            handler(payload) {
                console.log(payload);
            }
        }
    }
});

broker.start();
```

It’s Done !!!

Conclusion

- Microservice is more complex than monolithics
- Two Common way to communicate between services:
  - Req/Res
  - Pub/Sub
- Progressive microservice framework (like moleculer) make things easier
- There is no silver bullet

Further Reading

- https://moleculer.services/
- https://microservices.io/
- https://www.martinfowler.com/articles/microservices.html