microrestjs

A framework to develop microservices

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Problem

NodeJS provides a powerful platform for building fast and scalable network applications.

BUT, developers do not have tools to build and deploy systematically microservices.

Overview of microrestjs

- Approach to build and deploy microservices
- Specification to describe microservices
- Framework to develop microservices
- Core services to deploy common functionality

Service-oriented Architecture

"Service-Oriented Architecture (SOA) is a paradigm for organizing and utilizing **distributed capabilities** that may be under the control of different **ownership** domains."

OASIS, SOA Reference Model

Services

"A **service is a mechanism to** enable **access** to one or more **capabilities**, where the access is provided using a **prescribed interface** and is exercised consistent with **constraints and policies** as specified by the **service description**."

OASIS, SOA Reference Model

Microservices Architectural Style

"The microservices architectural style is an approach to develop a **single application** as a **suite of** small **services**, each running in its **own process** and **communicating with** lightweight **mechanisms**."

James Lewis & Martin Fowler

SOA vs. Microservices Architectures

"In theory there is no difference. In practice **SOA** was applied to expose and reuse **business services at enterprise level**. **Microservices architectures** are used to structure **individual applications**."

Adam Bien

Reinventing the wheel

- Distributed capabilities
- Services
- Interfaces
- Services descriptions
- Communication mechanisms
- Ownership

Service Design Principles

1. Reusability
2. Formal contract
3. Loose coupling
4. Abstraction
5. Composability
6. Autonomy
7. Statelessness
8. Discoverability

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Approach of microrestjs

Approach: Definition Phase

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- **Goal:** Describe the service and its operations
- **How:** Creating a JSON file with the description
- **Format:** Microrestjs Service Description Specification
- **Principles:** Formal contract, Loose Coupling, Abstraction, Composability, Autonomy and Discoverability

Approach: Definition Phase

```
{
   “microrestSpecification”: 1,
   “info”: {
      “name”: “example-helloworld”,
      “version”: “0.0.1”,
      “api”: 1,
      ...
   },
   “config”: {
      “location”: “directory”
      “dependiencies”: { ... }
   },
```

Approach: Definition Phase

```
"operations": {
   "greet": {
      "request": {
         "path": "/greet/:username",
         "method": "GET",
         ...
      },
      "responses": { ... },
      "errors": { ... }
   }
}
}
```

Approach: Development Phase

Approach: Development Phase

- **Goal:** Build the logic of the service
- **How:** Creating a JavaScript file with the functionality
- **Format:** Service Description
- **Principles:** Composability, Autonomy, Statelessness

Approach: Development Phase

```
function greet(request, response) {
  var greetBody = {
     greet: “Hello ” + request.params.username
  }

  response.status(200).json(greetBody).end();
}
```

Approach: Deployment Phase

Approach: Deployment Phase

- **Goal:** Deploy the services in a distributed context
- **How:** Running an instance of microrestjs with the service description and service functionality.
- **Principles:** Discoverability

Approach: Deployment Phase

1. Configure microrestjs
2. Save the service description and functionality
3. Execute: *node Launcher.js*

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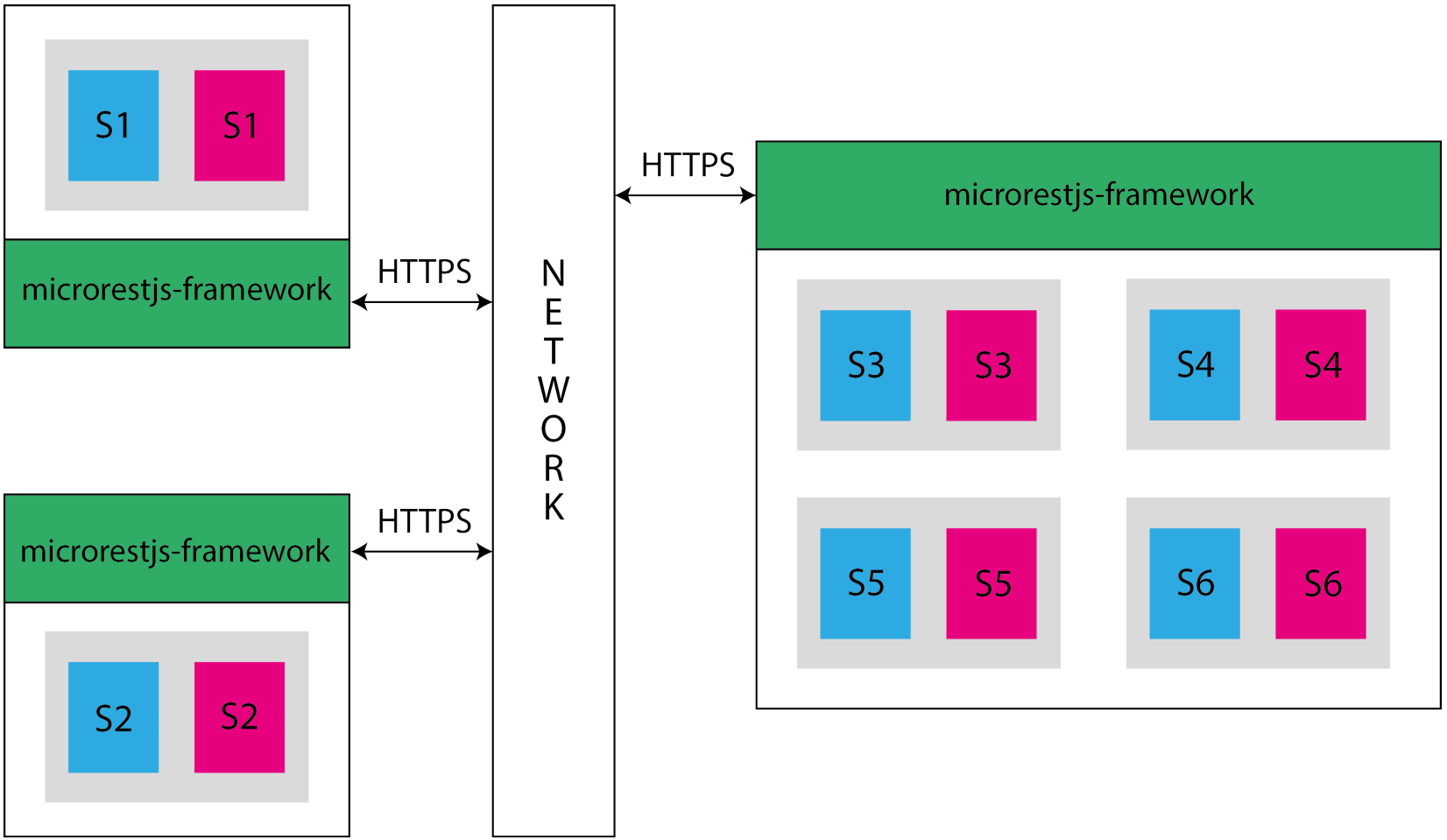
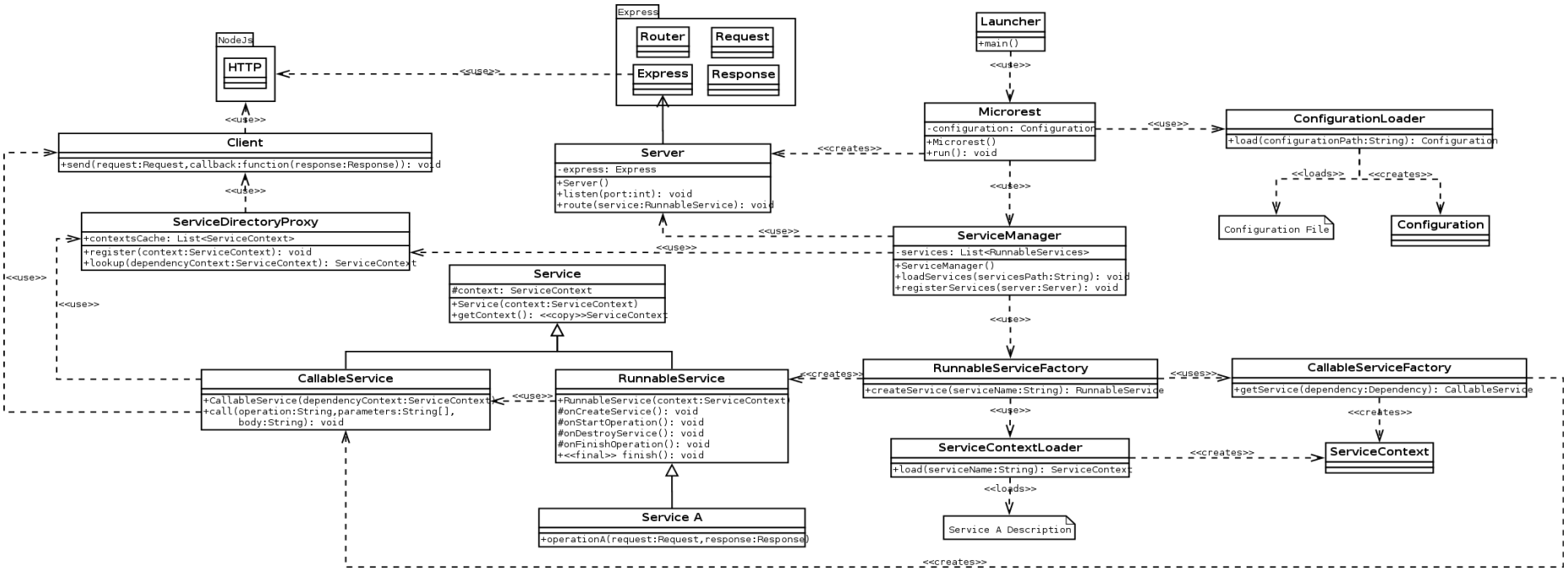
Framework: Architecture

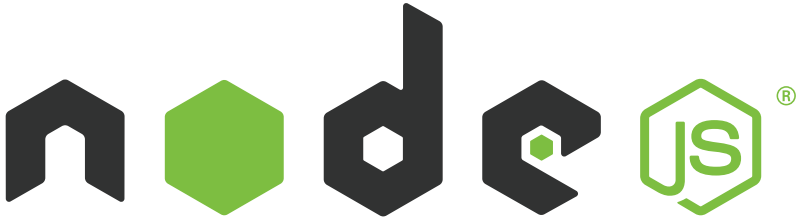


Framework: Architecture



Framework: Technologies

express



OpenSSL

{JSON}

Framework: More and More

- Universally accessible
- RESTful API
- Standard web technologies (HTTP)
- Secure connections
- Location transparency

OPEN SOURCE – MIT License

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Advantages and Drawbacks

Dynamic load without compilation

Decrease in development time

Increase in documentation quality

Production ready without lock-in

Not a silver bullet, not for everything

Weakly typed programming

Strict development approach

No standard descriptions

Conclusion

WSDL

SOAP

HTTPS

NodeJS

SOA

Microservices

JSON

RESTful API

Web

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microrestjs