



# Towards the .NET Junior Developer

The extremely solid course

Towards the .NET Junior Developer

# Lesson 9

Software system architecture basics

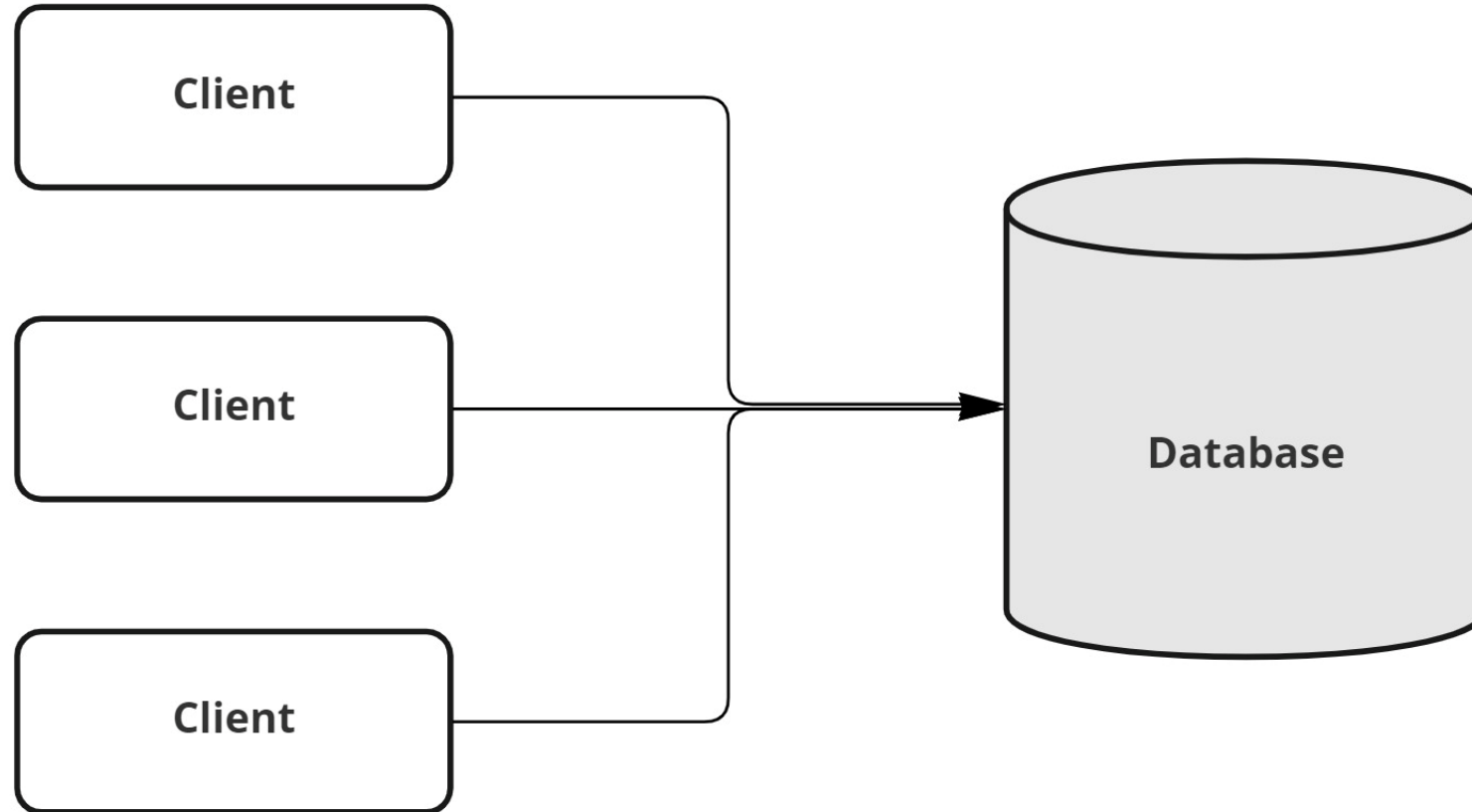
# Agenda



- [Architecture types](#)
  - [Two-tier application](#)
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Architecture \(REST\)](#)
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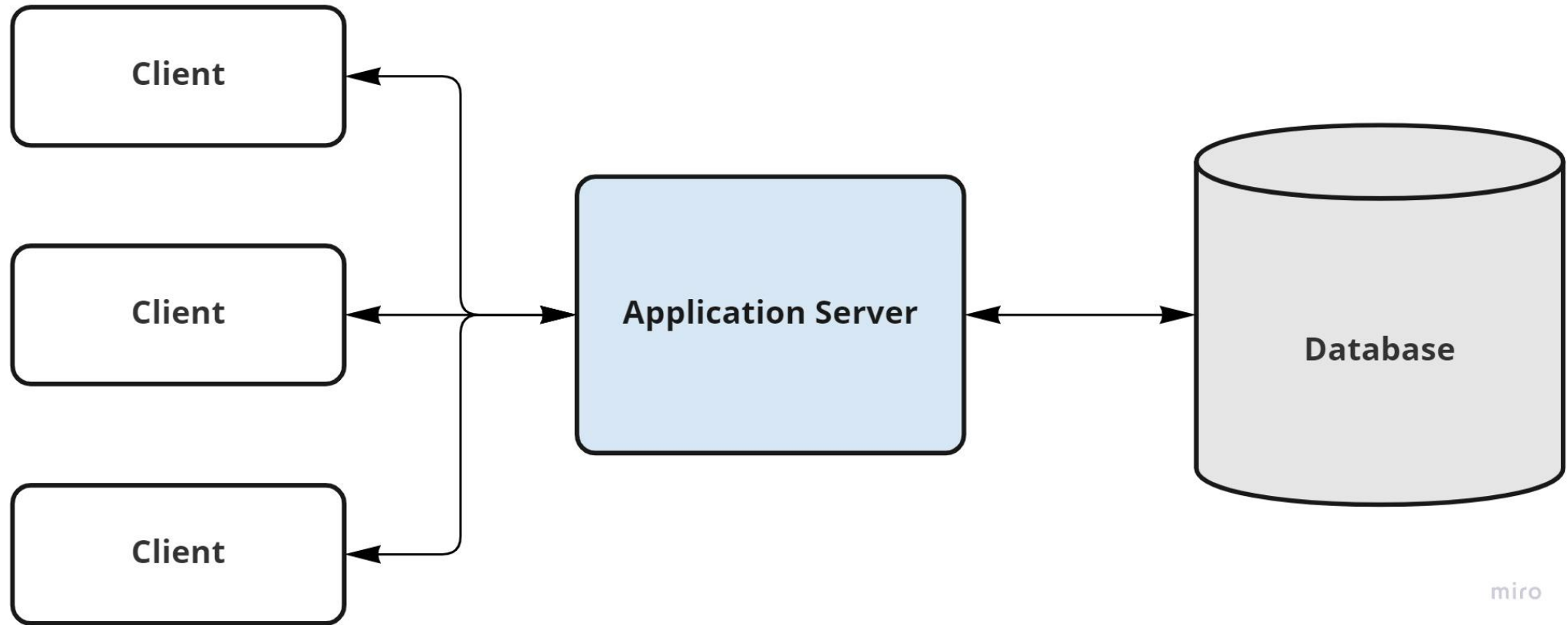
# Architecture types

# Two-tier application

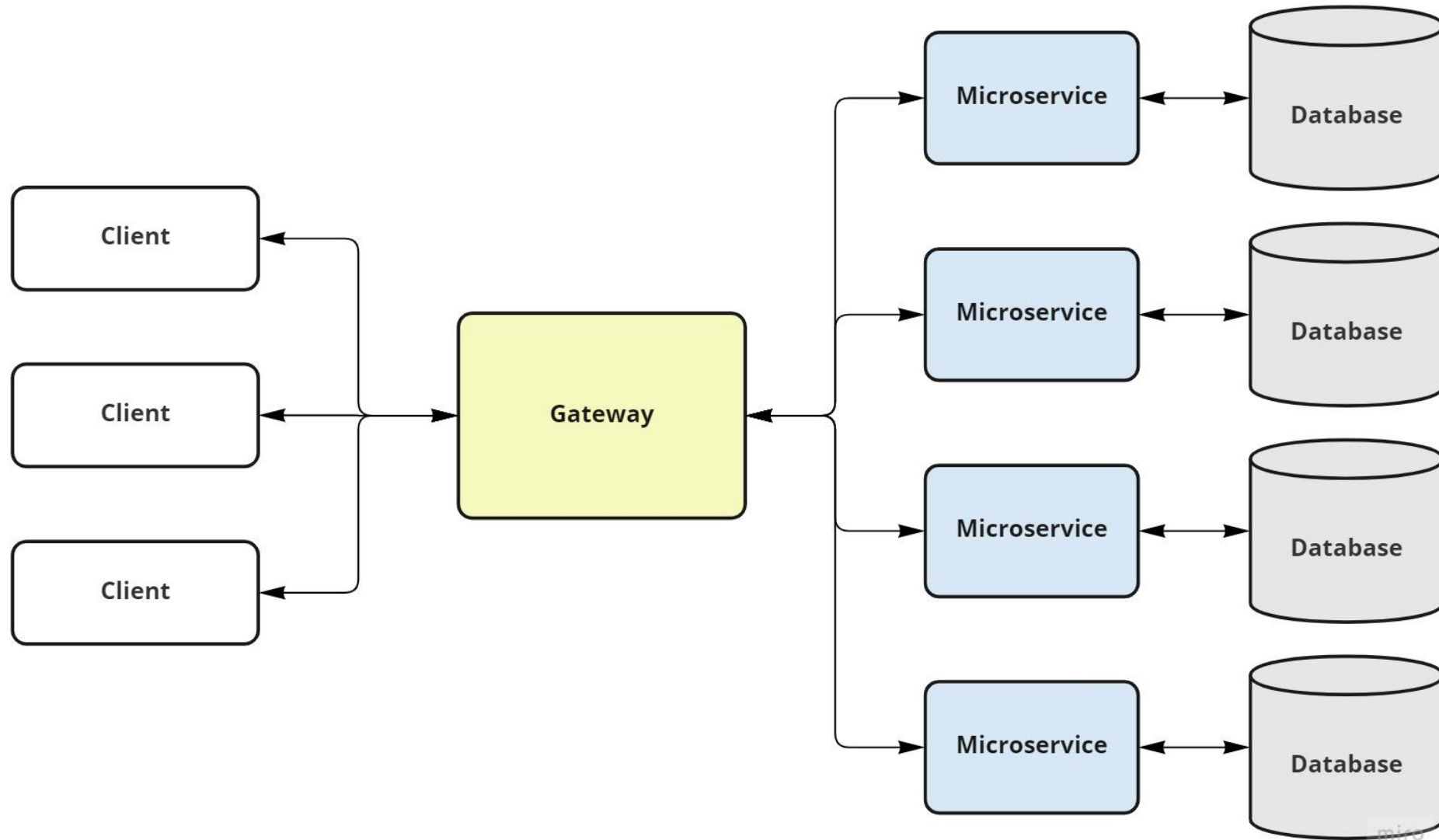


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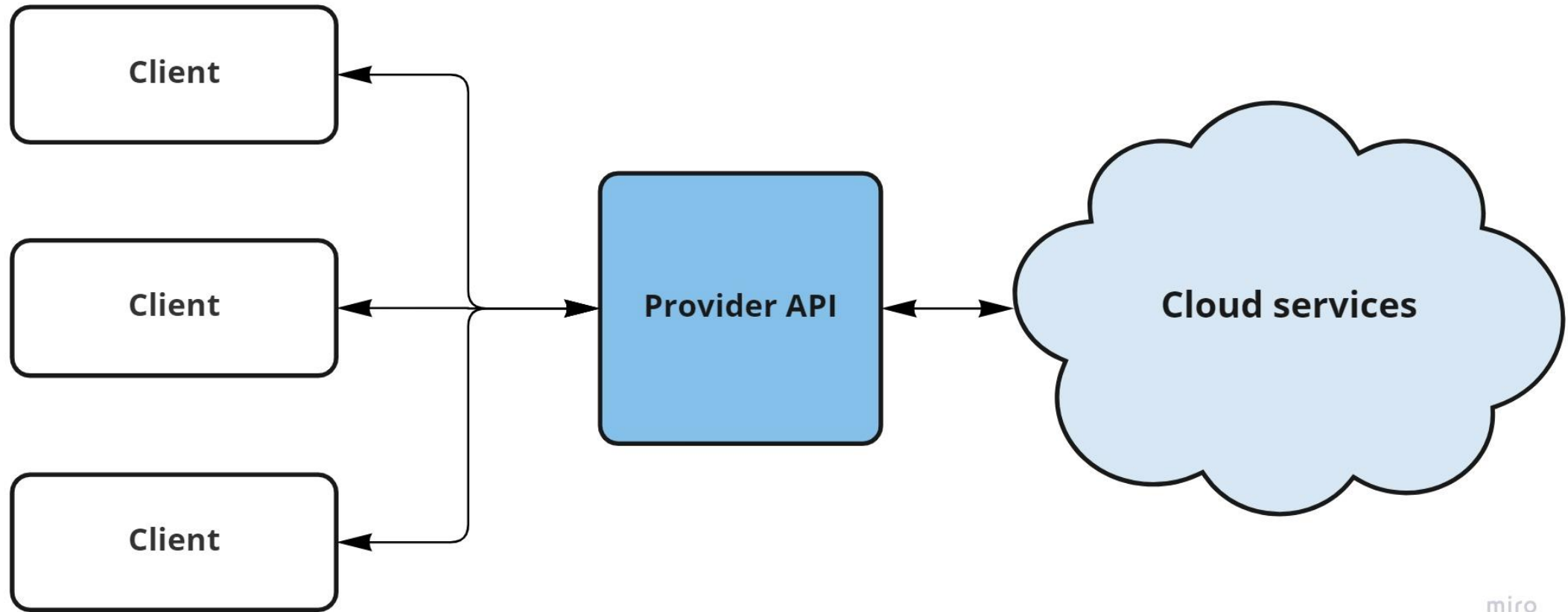
# Three-tier application



# Microservices



# Serverless





# Architecture styles

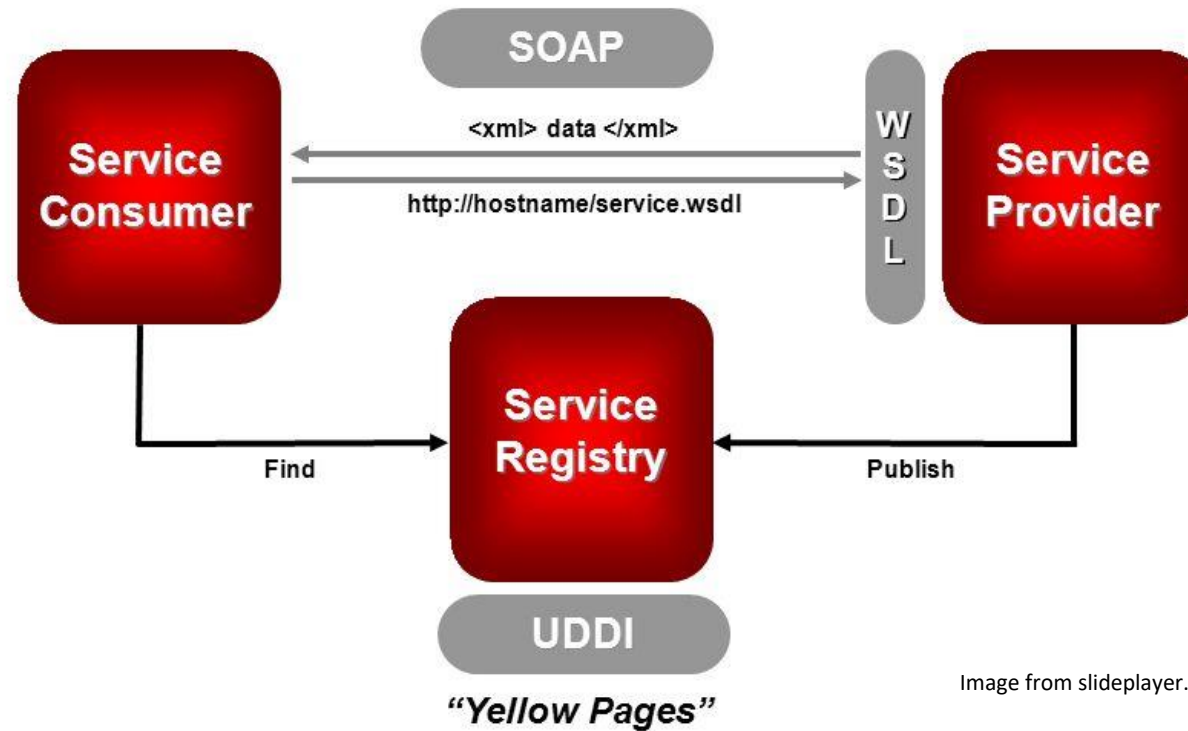
# Service-Oriented Architecture (SOA)

**DO NOT CONFUSE WITH SOAP** - Simple **O**bject **A**ccess **P**rotocol

- Focuses on services and its operations
- Supports standardization
- Uses contracts with all operations and data types
- Uses errors processing policy
- Very flexible
- More complex than REST (usually)

# Service-Oriented Architecture (SOA)

## Service-Oriented Architecture



# Service-Oriented Architecture (SOA)

**SOAP** - Simple **O**bject **A**ccess **P**rotocol – is the most powerful protocol that could be applied to the requirements of SOA

## Протокол SOAP, запрос и ответ

Запрос

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:demo="http://fto.com.ru/demo">
  <soap:Header/>
  <soap:Body>
    <demo:СлучайноеЧисло>
      <demo:Минимум>10</demo:Минимум>
      <demo:Максимум>30</demo:Максимум>
    </demo:СлучайноеЧисло>
  </soap:Body>
</soap:Envelope>
```

Ответ

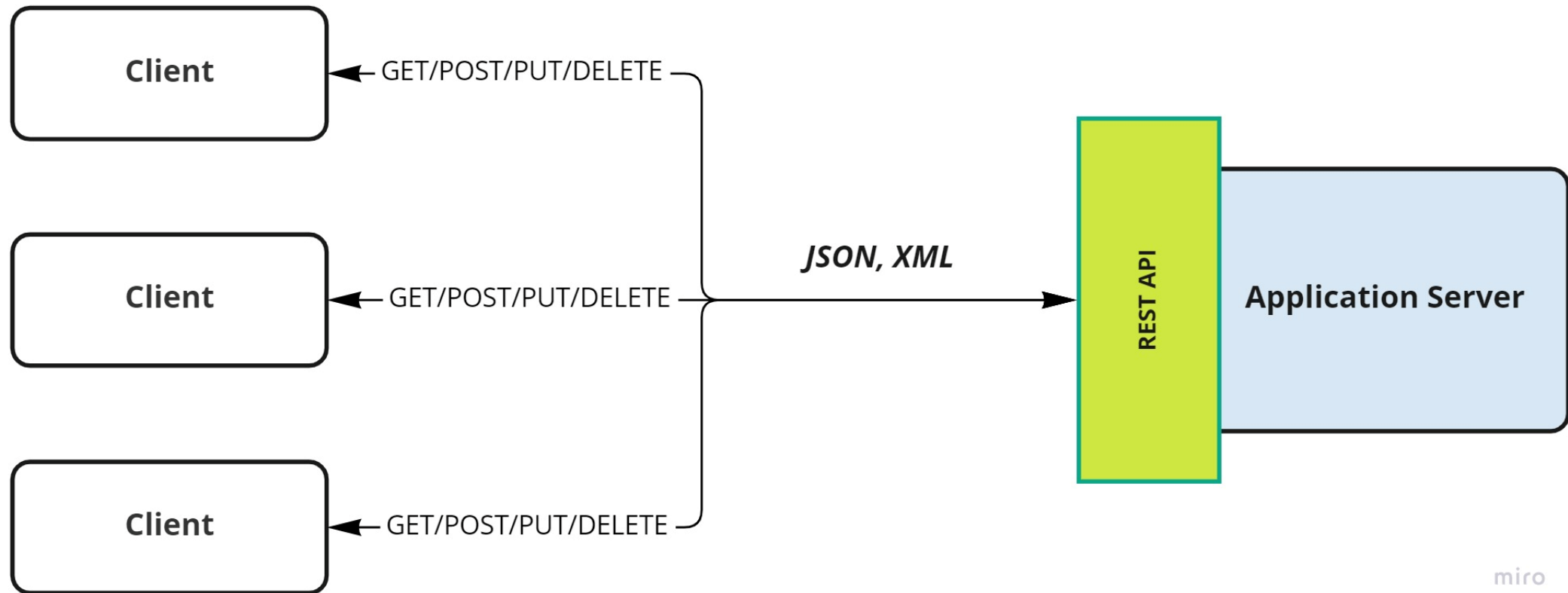
```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope">
  <soap:Body>
    <m:СлучайноеЧислоResponse
      xmlns:m="http://fto.com.ru/demo">
      <m:return
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        14</m:return>
```

Image from mypresentation.ru

# Representational State Transfer Architecture (REST)

- Focuses on **resources** rather than operations
- Every “thing” has its own **ID**
- **NO** state on the server (stateless)
- Works over HTTP
- Uses HTTP error codes
- Resources are using by the **representation form**
- Contracts can be implemented
- Easy to implement (usually)

# Representational State Transfer Architecture (REST)



miro

# Representational State Transfer Architecture (REST)

GET 'https://cofeestore.com/products'

Get all products

GET 'https://cofeestore.com/products/1'|

Get product with ID=1

GET 'https://cofeestore.com/products?productType=1'

Get product with ProductType=1

POST 'https://cofeestore.com/products'

Create new products

PUT 'https://cofeestore.com/products?productType=1'|

Create new product with ID=1

DELETE 'https://cofeestore.com/products?productType=1'

Delete product with ID=1

# JSON format

```
{
  "glossary": {
    "title": "example glossary",
    "GlossDiv": {
      "title": "S",
      "GlossList": {
        "GlossEntry": {
          "ID": "SGML",
          "SortAs": "SGML",
          "GlossTerm": "Standard Generalized Markup Language",
          "Acronym": "SGML",
          "Abbrev": "ISO 8879:1986",
          "GlossDef": {
            "para": "A meta-markup language, used to create markup languages such as DocBook.",
            "GlossSeeAlso": [
              "GML",
              "XML"
            ]
          },
          "GlossSee": "markup"
        }
      }
    }
  }
}
```



# Books of the day

[Fowler M. - Patterns of Enterprise Application Architecture](#)

[Hohpe G. - Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solutions](#)

[Newman S. - Monolith to Microservices: Evolutionary Patterns to Transform Your Monolith](#)

[Kleppmann M. - Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems](#)



# Links of the day

[Architecture types \(Medium\)](#)

[Architecture types \(Habr\)](#)

[RESTful service criterias \(Habr\)](#)

[REST vs SOAP \(Habr\)](#)

[Software architecture articles on TProger](#)

[Software architecture \(Telegram channel\)](#)



# Hometask

Nothing today. Hooraaay!

That's all for this time!