

Service Oriented Architecture

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Service Oriented Architecture (SOA)

- Service-oriented architecture (SOA) is a method of software development that uses software components called services to create business applications.
- Each service provides a business capability, and services can also communicate with each other across platforms and languages.

Basic Principles of SOA

Interoperability

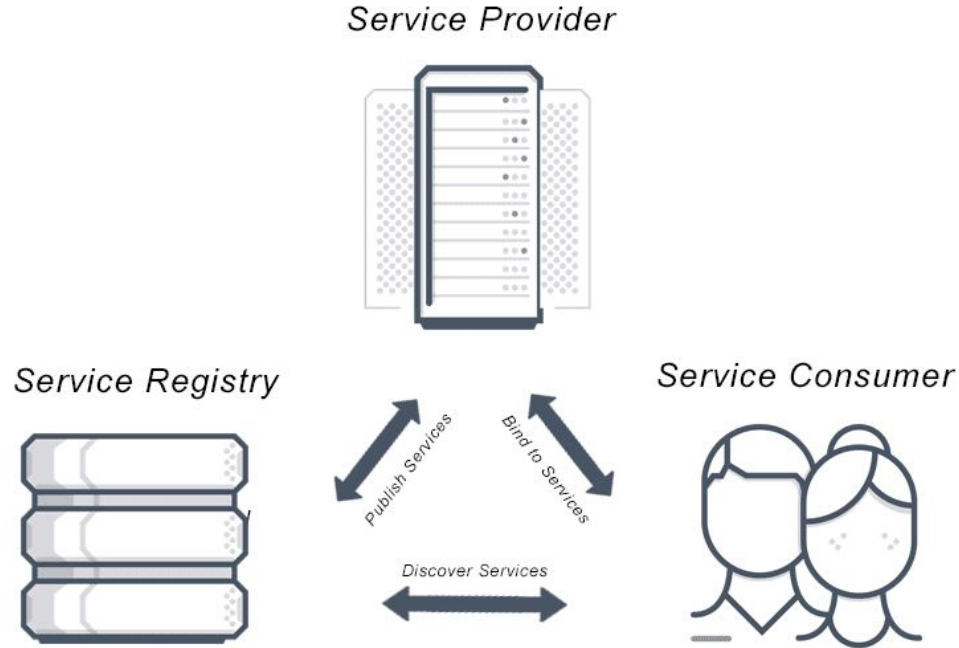
Loose coupling

Abstraction

Granularity

SOA Triangle

The Service Oriented Architecture Triangle



SOA Communication Protocols

- Simple Object Access Protocol (SOAP)
- RESTful HTTP
- Apache Thrift
- Apache ActiveMQ
- Java Message Service (JMS)

Web Services

A web service is any piece of software that makes itself available over the internet and uses a standardized XML messaging system

Components of Web Services

- SOAP (Simple Object Access Protocol)
- UDDI (Universal Description, Discovery and Integration)
- WSDL (Web Services Description Language)

WSDL Example

```
<message name="getTermRequest">
```

```
  <part name="term" type="xs:string"/>
```

```
</message>
```

```
<message name="getTermResponse">
```

```
  <part name="value" type="xs:string"/>
```

```
</message>
```

```
<portType name="glossaryTerms">
```

```
  <operation name="getTerm">
```

```
    <input message="getTermRequest"/>
```

```
    <output message="getTermResponse"/>
```

```
  </operation>
```

```
</portType>
```

SOAP Example

```
<?xml version="1.0"?>
```

```
<soap:Envelope
```

```
  xmlns:soap="http://www.w3.org/2003/05/soap-envelope/"
```

```
  soap:encodingStyle="http://www.w3.org/2003/05/soap-encoding">
```

```
<soap:Body>
```

```
  <m:GetPrice xmlns:m="https://www.w3schools.com/prices">
```

```
    <m:Item>Apples</m:Item>
```

```
  </m:GetPrice>
```

```
</soap:Body>
```

```
</soap:Envelope>
```

```
<?xml version="1.0"?>
```

```
<soap:Envelope
```

```
  xmlns:soap="http://www.w3.org/2003/05/soap-  
-envelope/"
```

```
  soap:encodingStyle="http://www.w3.org/2003  
/05/soap-encoding">
```

```
<soap:Body>
```

```
  <m:GetPriceResponse
```

```
    xmlns:m="https://www.w3schools.com/prices"  
>
```

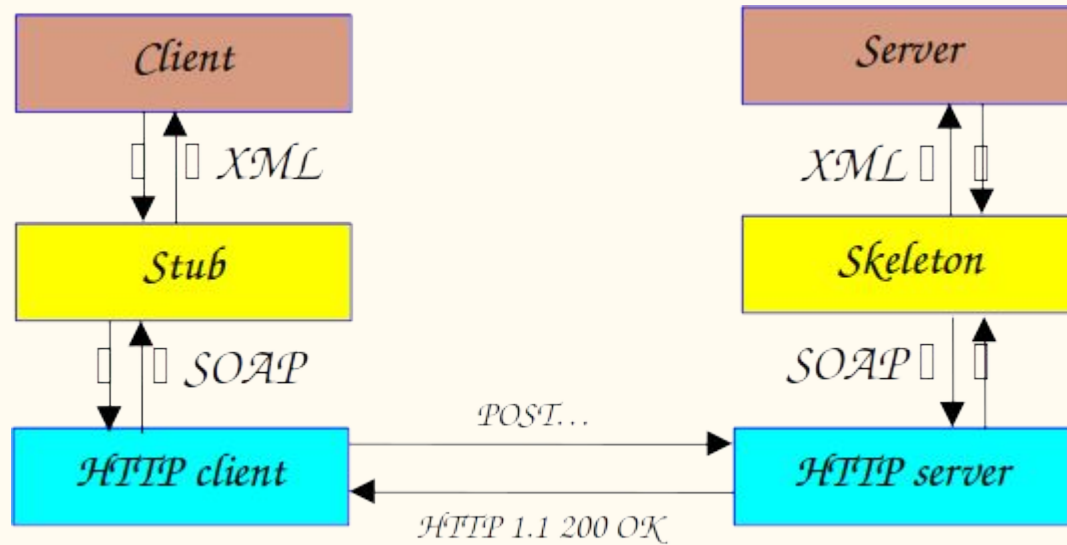
```
    <m:Price>1.90</m:Price>
```

```
  </m:GetPriceResponse>
```

```
</soap:Body>
```

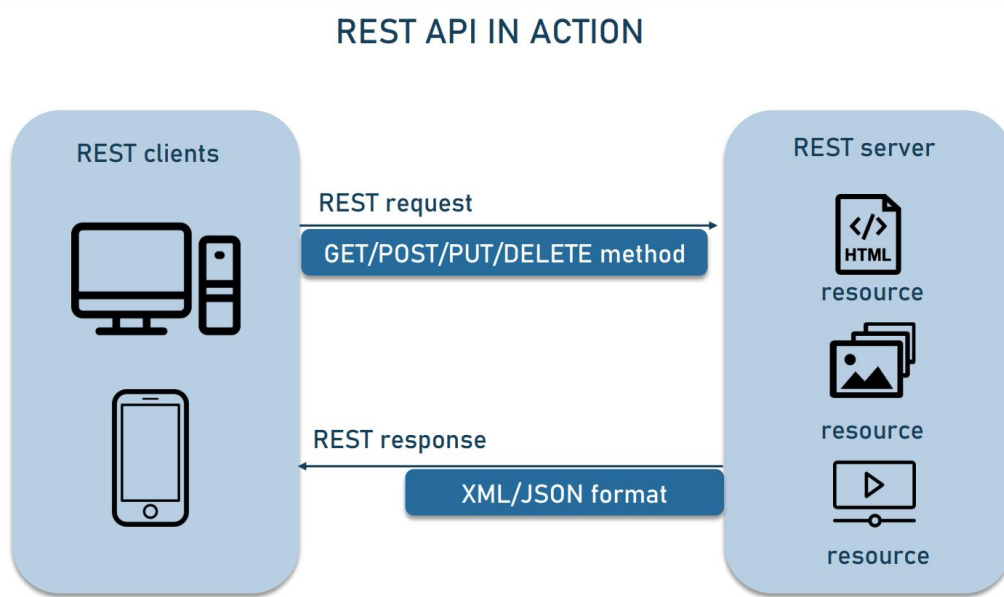
```
</soap:Envelope>
```


Web Services



REST

Representational State Transfer (REST)



REST Example

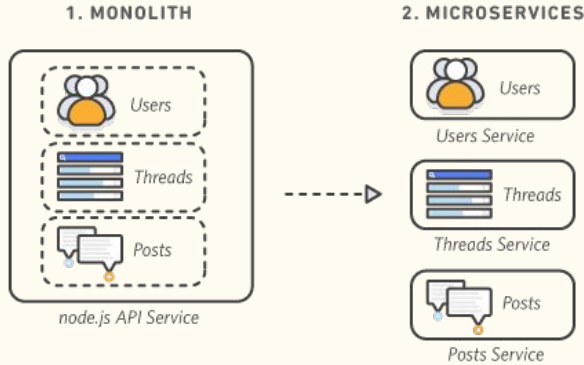
Get request: <https://opentdb.com/api.php?amount=1&category=18>

REST API using json: {"amount":1,"category":18}

Microservices

Microservices are an architectural and organizational approach to software development where software is composed of small independent services

Monolithic vs. Microservices



Source: <https://aws.amazon.com/microservices/>

- With monolithic architectures, all processes are tightly coupled and run as a single service.
- With a microservices architecture, an application is built as independent components that run each application process as a service.

Microservices Vs SOA

