Fundations of RESTful Architecture

KBTG - Kasikorn Business Technology Group

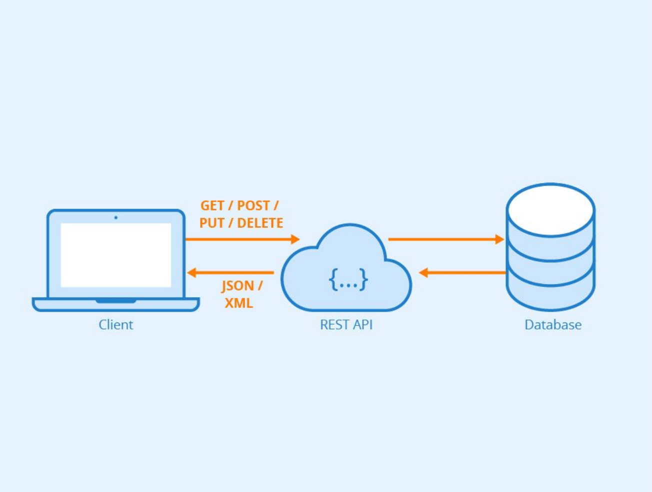
REST Architectural

Representational State Transfer (REST), a term coined by *Roy Fielding* in 2000. It is an architecture style for designing loosely coupled applications over HTTP, that is often used in the development of web services. REST does not enforce any rule regarding how it should be implemented at lower level, it just put high level design guidelines and leave you to think of your own implementation.

https://en.wikipedia.org/wiki/Roy_Fielding

The Basics

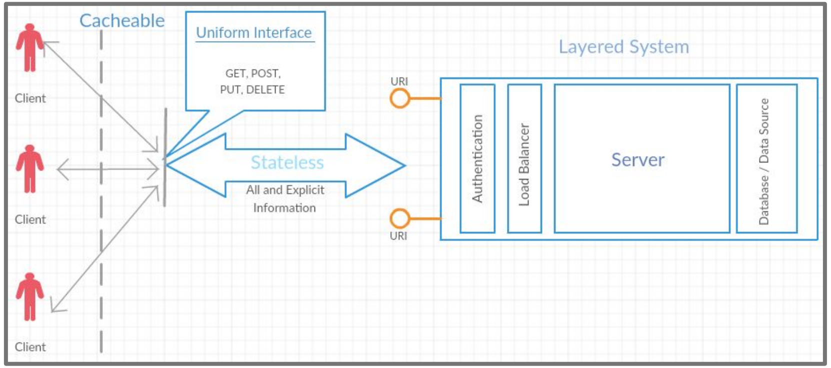
A RESTful API service is exposed through a Uniform Resource Locator (URL). This logical name separates the identity of the resource from what is accepted or returned. The URL scheme is defined in RFC 1738, which can be found here: ietf.org/rfc/rfc1738.txt



Architectural Constraints

REST defines 6 architectural constraints which make any web service – a true RESTful API.

- Uniform Interface
- Client - Server
- Stateless
- Cacheable
- Layered Systems
- Code On Demand (Optional)



https://dzone.com/articles/a-look-at-rest-api-design-patterns

{ REST }

Let’s start design RESTful API

#1 : Identify Object Model

First step in designing a REST API based application is – identifying the objects which will be presented as resources.

Some examples of a resource are:

- devices
- configurations

#2 : Create Model URIs

At this step, while designing the resource URIs – focus on the relationship between resources and its sub-resources

“URI should refer to a resource that is a thing (noun) instead of referring to an action (verb) because nouns have properties which verbs do not have – similar to resources have attributes.”

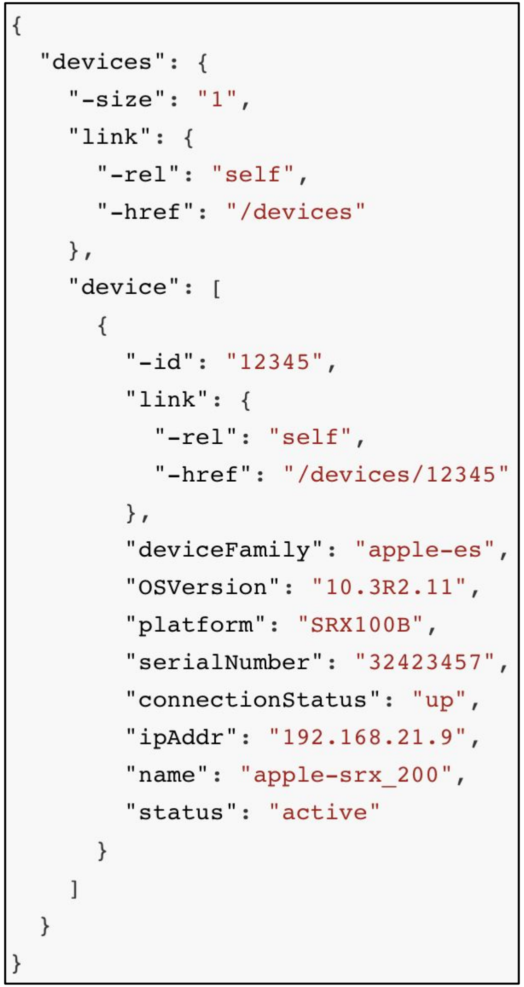
Some examples of a URIs are:

- /devices
- /devices/{id}
- /configurations
- /configurations/{id}
- /devices/{id}/configurations
- /devices/{id}/configurations/{id}

#3 : Defined Representations

Mostly representations are defined in either XML or JSON format.

“Structure & Size of payload, also so impact to the performance of REST APIs.”



```
{
  "devices": {
    "-size": "1",
    "link": {
      "-rel": "self",
      "-href": "/devices"
    },
    "device": [
      {
        "-id": "12345",
        "link": {
          "-rel": "self",
          "-href": "/devices/12345"
        },
        "deviceFamily": "apple-es",
        "OSVersion": "10.3R2.11",
        "platform": "SRX100B",
        "serialNumber": "32423457",
        "connectionStatus": "up",
        "ipAddr": "192.168.21.9",
        "name": "apple-srx_200",
        "status": "active"
      }
    ]
  }
}
```

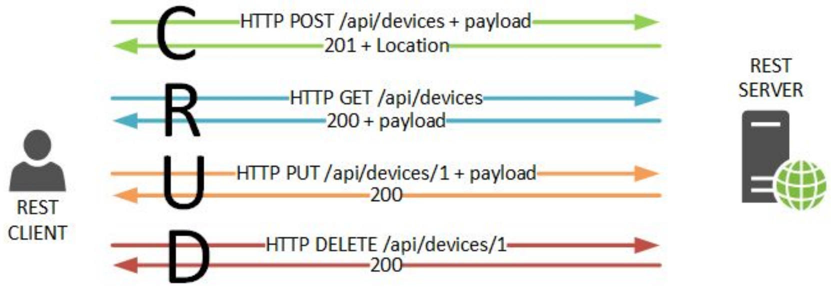
#4 : Assign HTTP Methods

Browse all devices or configurations

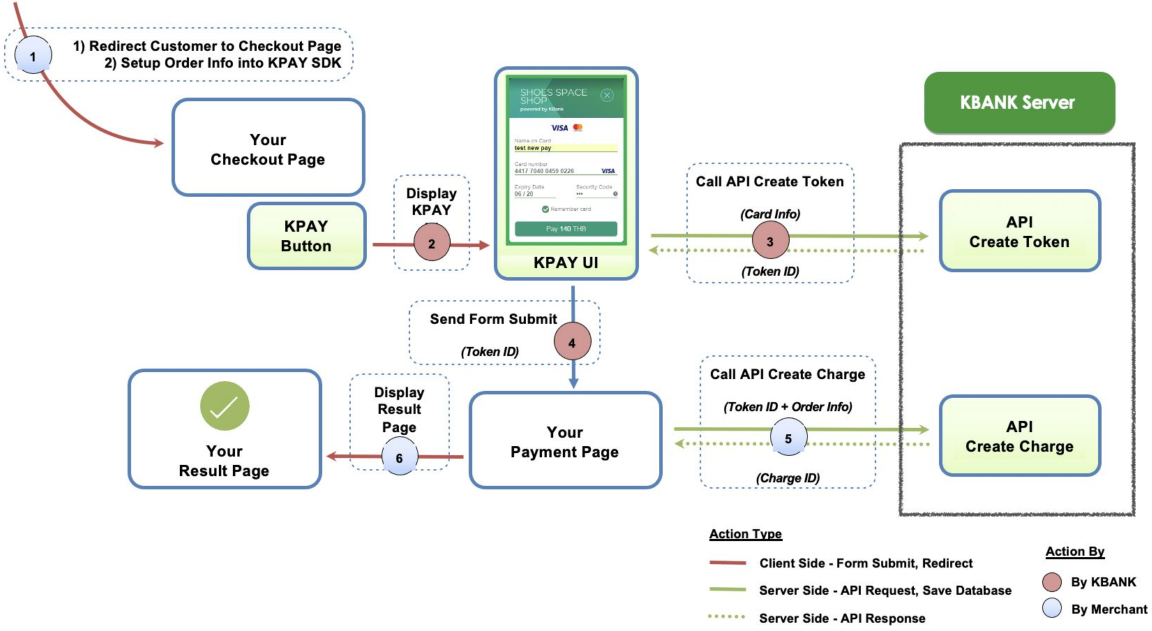
- HTTP GET /devices
- HTTP GET /configurations

Create a device or configuration

- HTTP POST /devices
- HTTP POST /configurations


C
HTTP POST /api/devices + payload
201 + Location
R
HTTP GET /api/devices
200 + payload
U
HTTP PUT /api/devices/1 + payload
200
D
HTTP DELETE /api/devices/1
200
REST CLIENT
REST SERVER

Concept of JS Plug-In : API Design Concept



1 1) Redirect Customer to Checkout Page
2) Setup Order Info into KPAY SDK

Your Checkout Page

KPAY Button

Display KPAY 2

SHOES SPACE SHOP
powered by KBank

Name on Card
test new pay

Card number
4417 7040 0459 0226

Expiry Date
06 / 20

Security Code
•••

Remember card

Pay 140 THB

KPAY UI

Call API Create Token
(Card Info) 3 *(Token ID)*

KBANK Server

API Create Token

Send Form Submit
(Token ID) 4

Your Payment Page

Call API Create Charge
(Token ID + Order Info) 5 *(Charge ID)*

API Create Charge

Display Result Page 6

Your Result Page

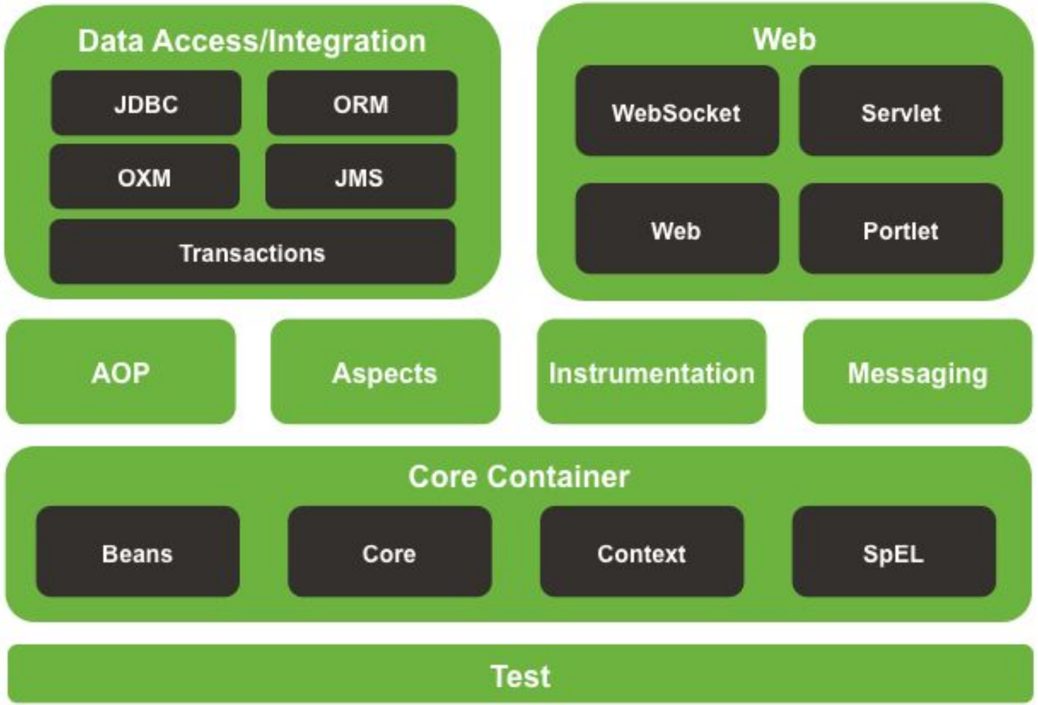
Action Type

- Client Side - Form Submit, Redirect
- Server Side - API Request, Save Database
- Server Side - API Response

Action By

- By KBANK
- By Merchant

Concept of JS Plug-In : API Design Concept (Spring Framework)



Data Access/Integration

JDBC

ORM

OXM

JMS

Transactions

Web

WebSocket

Servlet

Web

Portlet

AOP

Aspects

Instrumentation

Messaging

Core Container

Beans

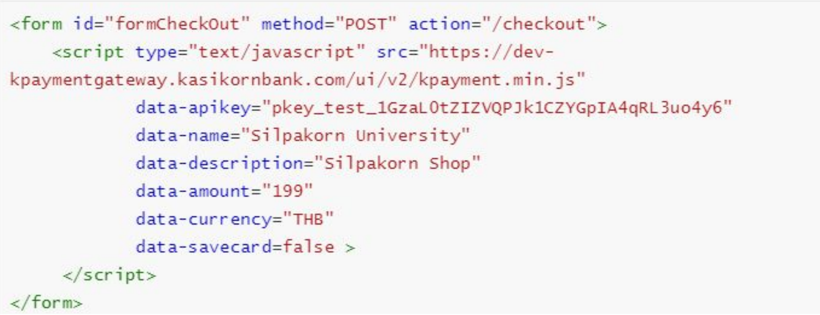
Core

Context

SpEL

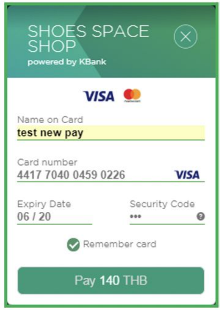
Test

Concept of JS Plug-In : UI Design Concept



```
<form id="formCheckOut" method="POST" action="/checkout">
    <script type="text/javascript" src="https://dev-
kpaymentgateway.kasikornbank.com/ui/v2/kpayment.min.js"
            data-apikey="pkey_test_1GzaL0tZIZVQPJk1CZYGpIA4qRL3uo4y6"
            data-name="Silpakorn University"
            data-description="Silpakorn Shop"
            data-amount="199"
            data-currency="THB"
            data-savecard=false >
     </script>
</form>
```

Card Payment



SHOES SPACE SHOP
powered by KBank

Name on Card
test new pay

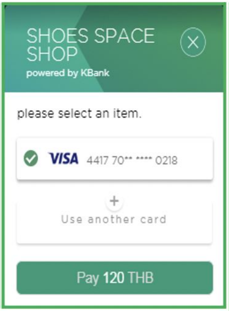
Card number
4417 7040 0459 0226

Expiry Date
06 / 20

Security Code
•••

Remember card

Enter Card Info



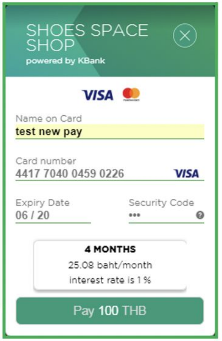
SHOES SPACE SHOP
powered by KBank

please select an item.

4417 70** **** 0218

Use another card

Tokenization



SHOES SPACE SHOP
powered by KBank

Name on Card
test new pay

Card number
4417 7040 0459 0226

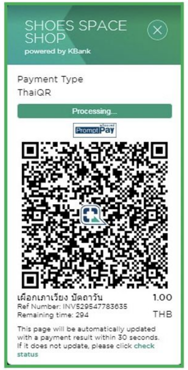
Expiry Date
06 / 20

Security Code
•••

4 MONTHS
25.08 baht/month
interest rate is 1 %

Installment

QR Payment



SHOES SPACE SHOP
powered by KBank

Payment Type
ThaiQR

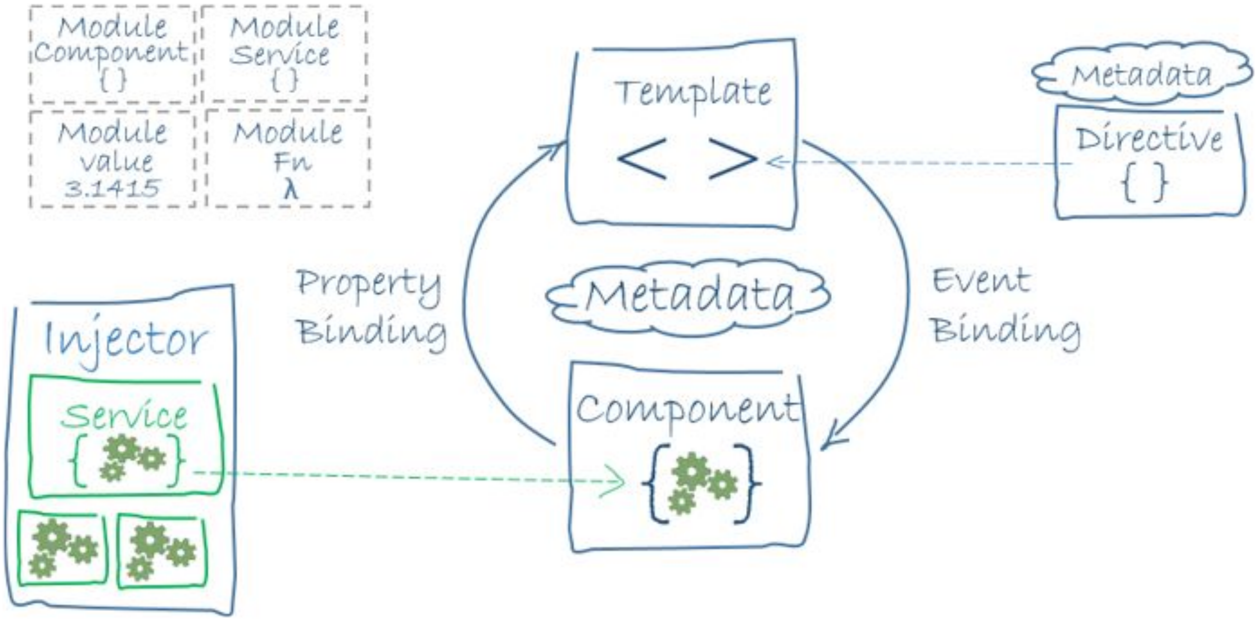
Processing...

เผือกเภาเวียง ปัดถาวัน 1.00
Ref Number: INV529547783635
Remaining time: 294 THB

This page will be automatically updated with a payment result within 30 seconds. If it does not update, please click check status

Thai QR Standard

Concept of JS Plug-In : UI Design Concept (Angular)



Read more:

- https://restfulapi.net/rest-api-design-tutorial-with-example
- https://dzone.com/articles/restful-architecture-101
- cheat sheet (Recommend)

Let’s start coding:

https://github.com/boonys20/payment-101