

# LAB3

# What's up !

- ❑ ThingWorx
- ❑ APIs
- ❑ RESTful APIs
- ❑ ThingWorx APIs

# ThingWorx

- An application development platform for the Internet of Things (IoT).
- Modeling the physical world to a digital ThingWorx model using the main Entity Types.
  - Things
  - Thing Shapes
  - Thing Templates.



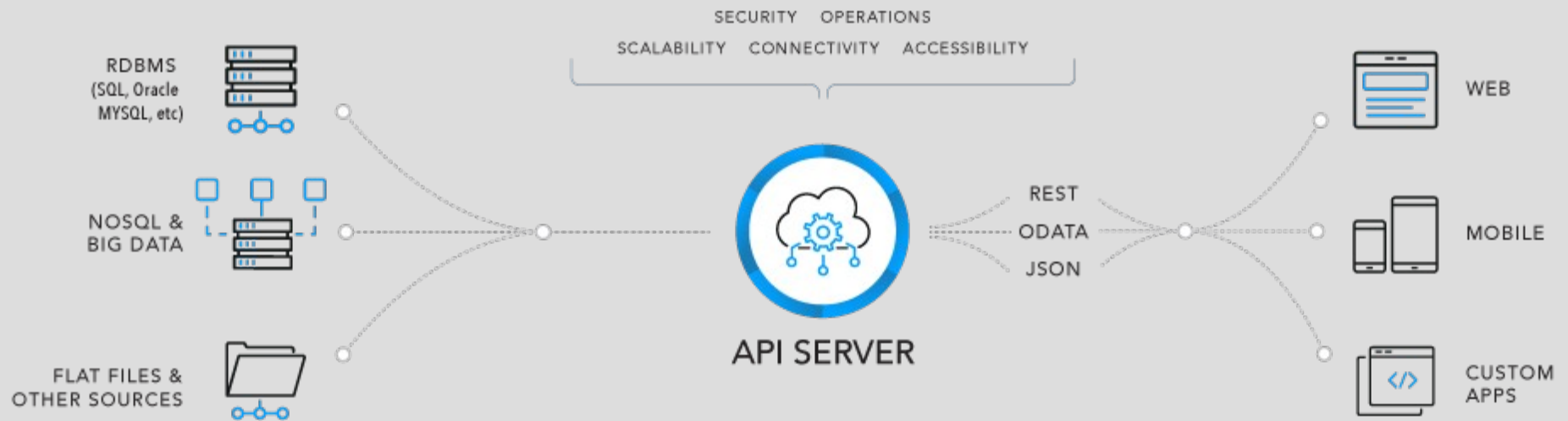
thingworx

- Helps business users define, manage, monitor and optimize their connected products as well as create and manage business processes related to the IoT devices.
- Provide Model-based rapid application development tools.
  - a drag-and-drop mashup builder for assembling dashboards and other applications

# APIs

- Stands for Application Programing Interface
- It is some kind of interface which has a set of functions that allow programmers to access specific features or data of an application, operating system or other services.
- Web API is an API over the web which can be accessed using HTTP protocol.

- APIs provide:
  - Business To Business Integration (B2B).
  - Code Reusability
  - Platform independent communication



- Google Maps, Facebook, Twitter, Stormpath,...etc

# RESTful APIs

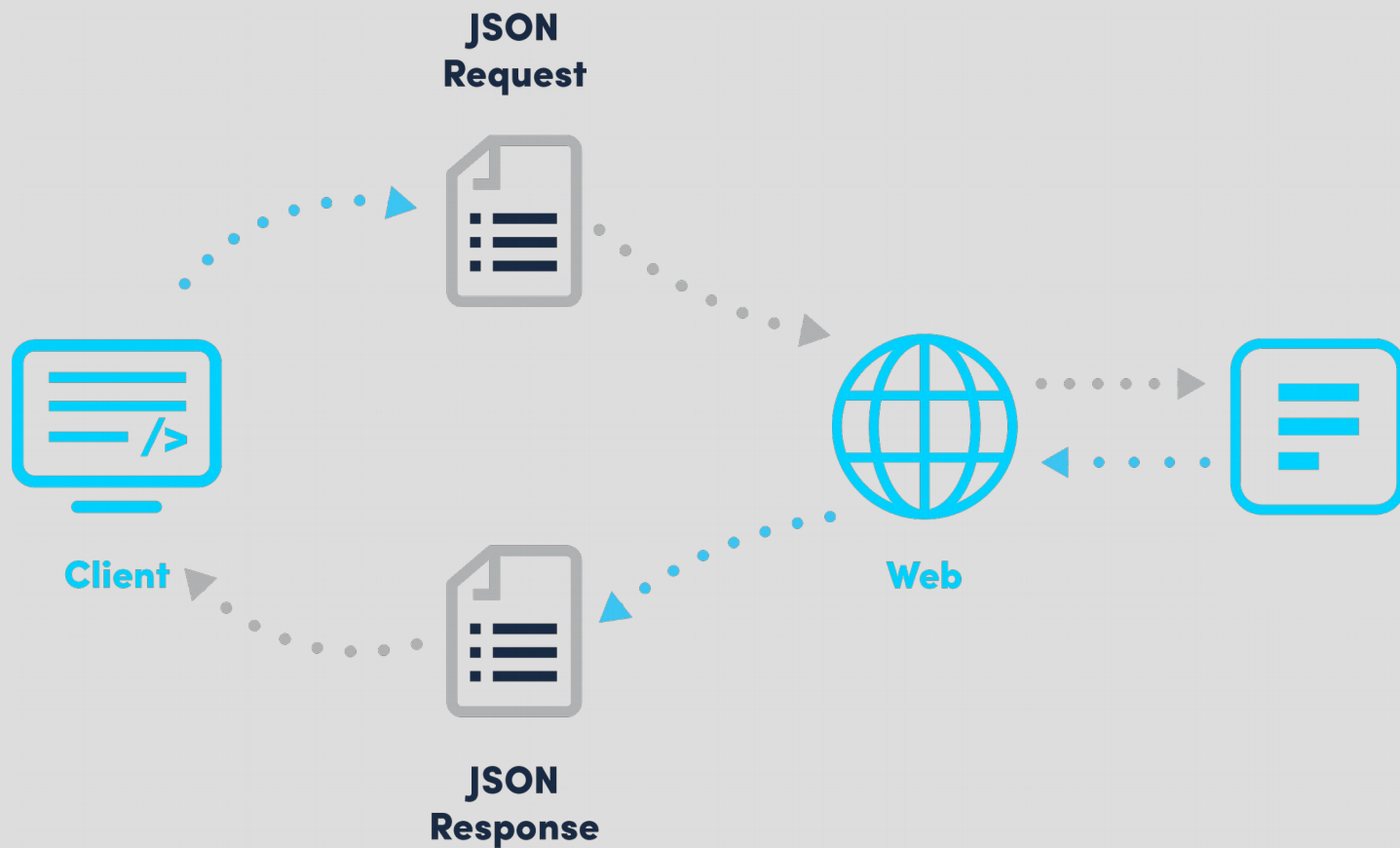
- Stands for Representational State Transfer
- Is architectural Style allows two software programs to communicate with each another.
- Methods to perform the desired transition:
  - GET: Retrieve
  - PUT: Update
  - POST: Create
  - DELETE: delete



RESTful API

DELETE POST PUT GET

- Takes advantage of HTTP when used for Web APIs.





- JSON is text, written with JavaScript object notation
- Very useful for exchanging data.

```
1  import json
2
3  x = {
4      "name": "John",
5      "age": 30,
6      "city": "New York"
7  }
8
9  print(x["age"])    # 30
```

- Everything is a resource
- Any resource can be accessed by a URI



# ThingWorx APIs

- Almost every entity and service of ThingWorx can be accessed through the REST API
- REST API Core Concepts

```
headers = {'appkey':'<appkey_code>', 'Content-Type':'application/json'}  
payload = {}  
requests.<method>('http://<SERVER>/Thingworx/<Entity>/<EntityName>/<collection>/<collectionName>', json=payload, headers=headers)
```

## Required part of REST API

Host and optional port

- http or https

`http://52.201.57.6:80/Thingworx/Things/MyTestThing/Properties/SomeNumber`

Entity Type	URL Path
Logs	/Thingworx/Logs
Users	/Thingworx/ <u>Users</u>
Dashboards	/Thingworx/Dashboards
Groups	/Thingworx/Groups
Mashups	/Thingworx/ <u>Mashups</u>
Menus	/Thingworx/ <u>Menus</u>
ModelTags	/Thingworx/ <u>ModelTags</u>
Networks	/Thingworx/Networks
DataTags	/Thingworx/DataTags
DataShapes	/Thingworx/DataShapes
ThingShapes	/Thingworx/ <u>ThingShapes</u>
ThingTemplates	/Thingworx/ThingTemplates
Things	/Thingworx/Things
Resources	/Thingworx/ <u>Resources</u>

Entity Collection

Name of a  
specific entity

Name of a specific  
characteristic

Characteristic Type	URL PATH
Current Property Values	/Thingworx/ <u>Things</u> / <u>&lt;name of Thing&gt;</u> /Properties
Property Definition	/Thingworx/ <u>Things</u> / <u>&lt;name of Thing&gt;</u> / <u>PropertyDefinitions</u>
Service Definition	/Thingworx/ <u>Things</u> / <u>&lt;name of Thing&gt;</u> / <u>ServiceDefinitions</u>
Event Definitions	/Thingworx/ <u>Things</u> / <u>&lt;name of Thing&gt;</u> / <u>EventDefinitions</u>

Characteristic  
Collection

- Create Application Key
- Give required permission
- Request !