

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.



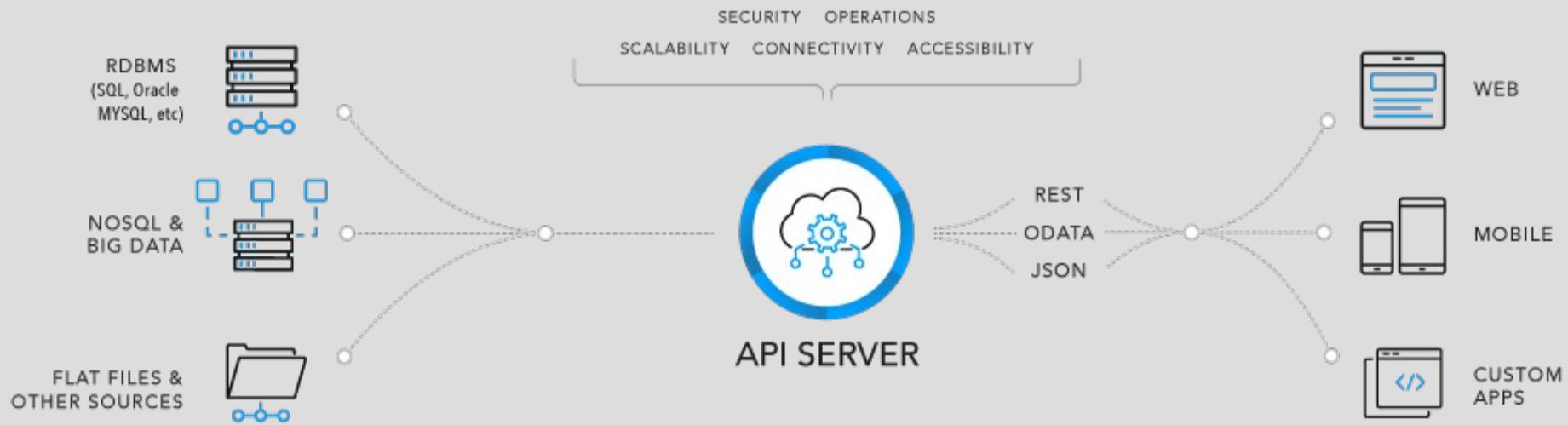
thingworx

- 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 Programming 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



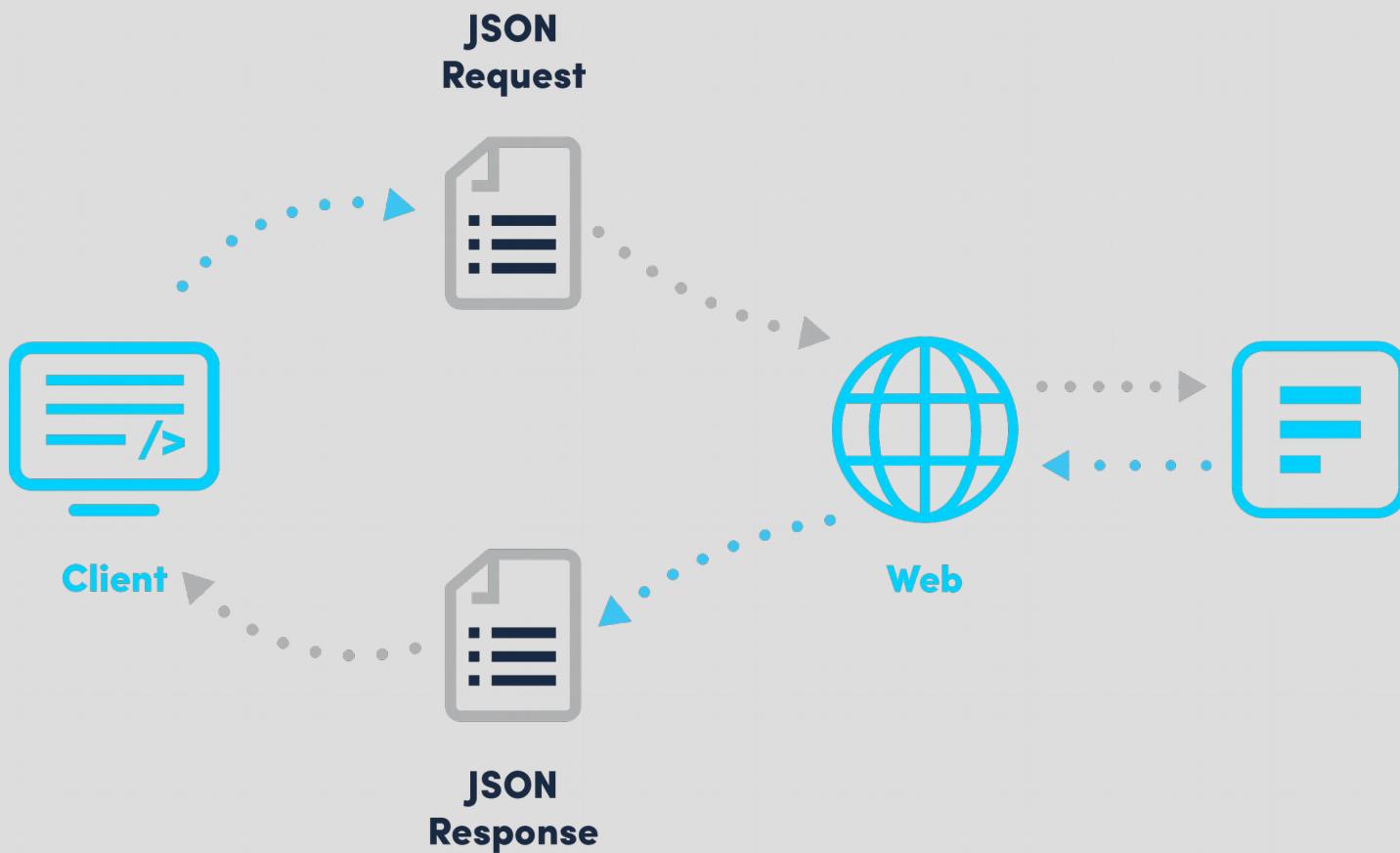
- Google Maps, Facebook, Twitter, Stormpath, . . . etc

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



- 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/Users
Dashboards	/Thingworx/Dashboards
Groups	/Thingworx/Groups
Mashups	/Thingworx/Mashups
Menus	/Thingworx/Menus
ModelTags	/Thingworx/ModelTags
Networks	/Thingworx/Networks
DataTags	/Thingworx/DataTags
DataShapes	/Thingworx/DataShapes
ThingShapes	/Thingworx/ThingShapes
ThingTemplates	/Thingworx/ThingTemplates
Things	/Thingworx/Things
Resources	/Thingworx/Resources

Entity Collection

Name of a specific entity

Name of a specific characteristic

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

Characteristic Collection

- Create Application Key
- Give required permission
- Request !