finding the beginners mind

highly-extensible, open-source Node.js framework

https://loopback.io/

GROUND UP SERIES

LoopBack.io
Node.js API Framework

LOOPBACK.IO

Syed Awase Khirni

Syed Awase earned his PhD from University of Zurich in GIS, supported by EU V Framework Scholarship from SPIRIT Project (www.geo-spirit.org). He currently provides consulting services through his startup www.territorialprescience.com and www.sycliq.com . He empowers the ecosystem by sharing his technical skills worldwide, since 2008. He provides training in Java Technology Stack, .Net Technology Stack, R, DataScience, Client Side frameworks (Angular,KnockOut,Aurelia,Vue,Ember, Backbone etc..), Node Stack, Machine Learning, Python Stack, Php Stack.

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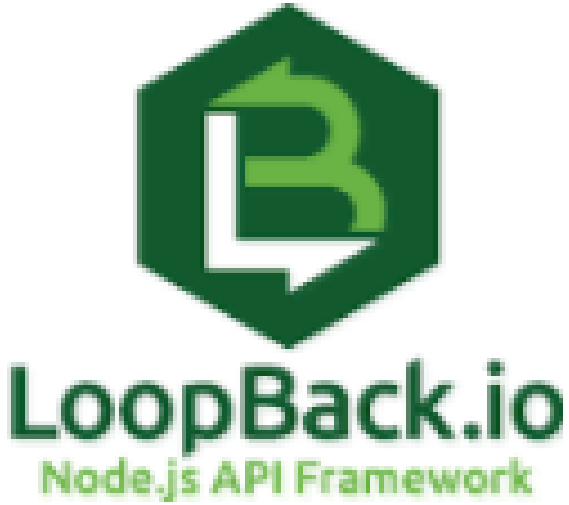
Slide Version Updates

Last Updated	Version	Release Date	Updated by	Code Plays Done @

https://docs.strongloop.com/display/ALLDOCS/PDF+version

LoopBack.io: Introduction

SYED AWASE KHIRNI



https://loopback.io/

A highly extensible, open-source Node.js framework that enables you to create dynamic end-to-end REST APIs with little or no coding. **Open source with MIT Licensing agreement.**

Application Development and Service Model Evolution

Application Server

AppServer Iaas

PaaS

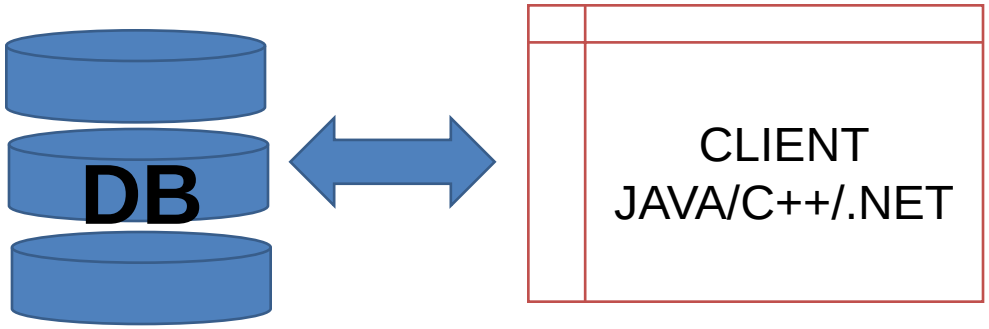
mBaaS Mobile backend as a service (MBaaS),

API Server

A Business process demands cross-domain collaboration

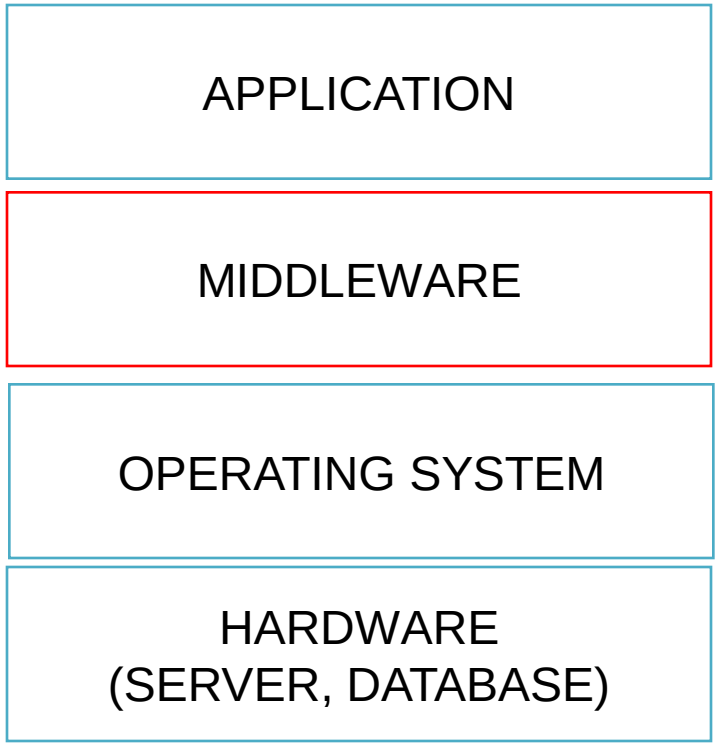
Technology required to support cross-channel/platform business logic

2- Tier Architecture



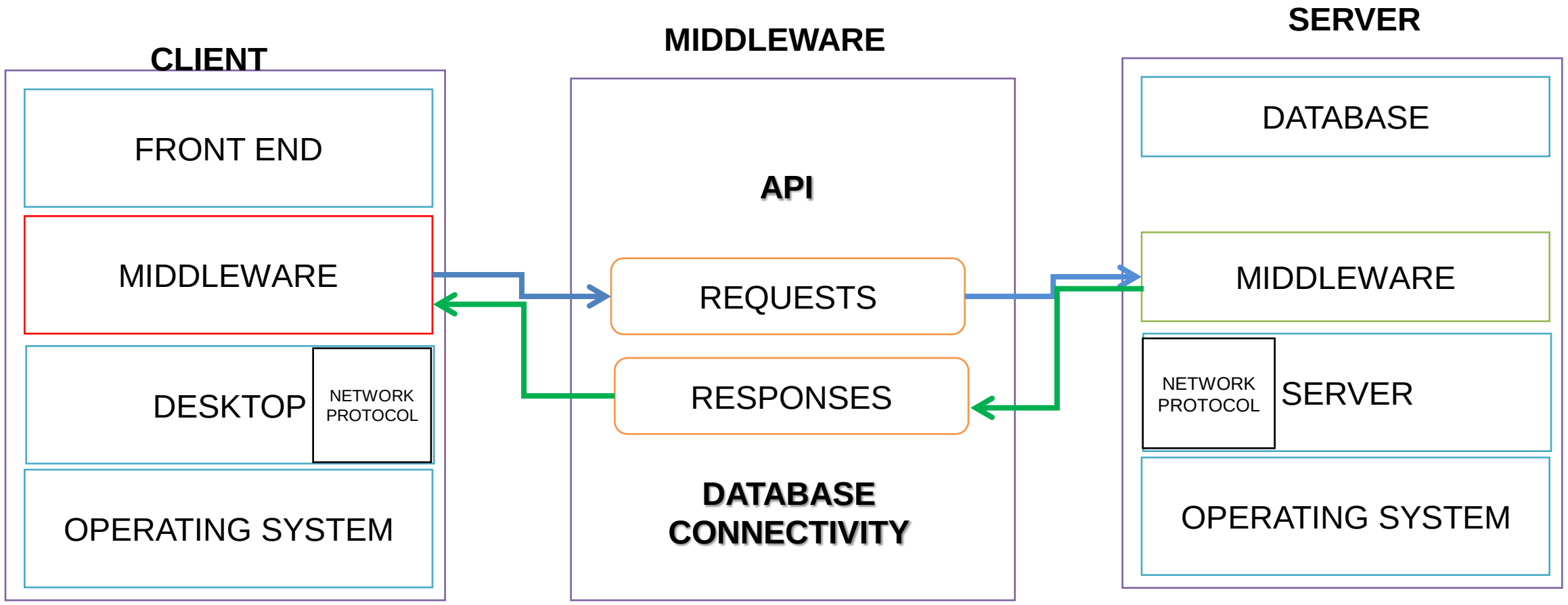
3- Tier Architecture

Middleware

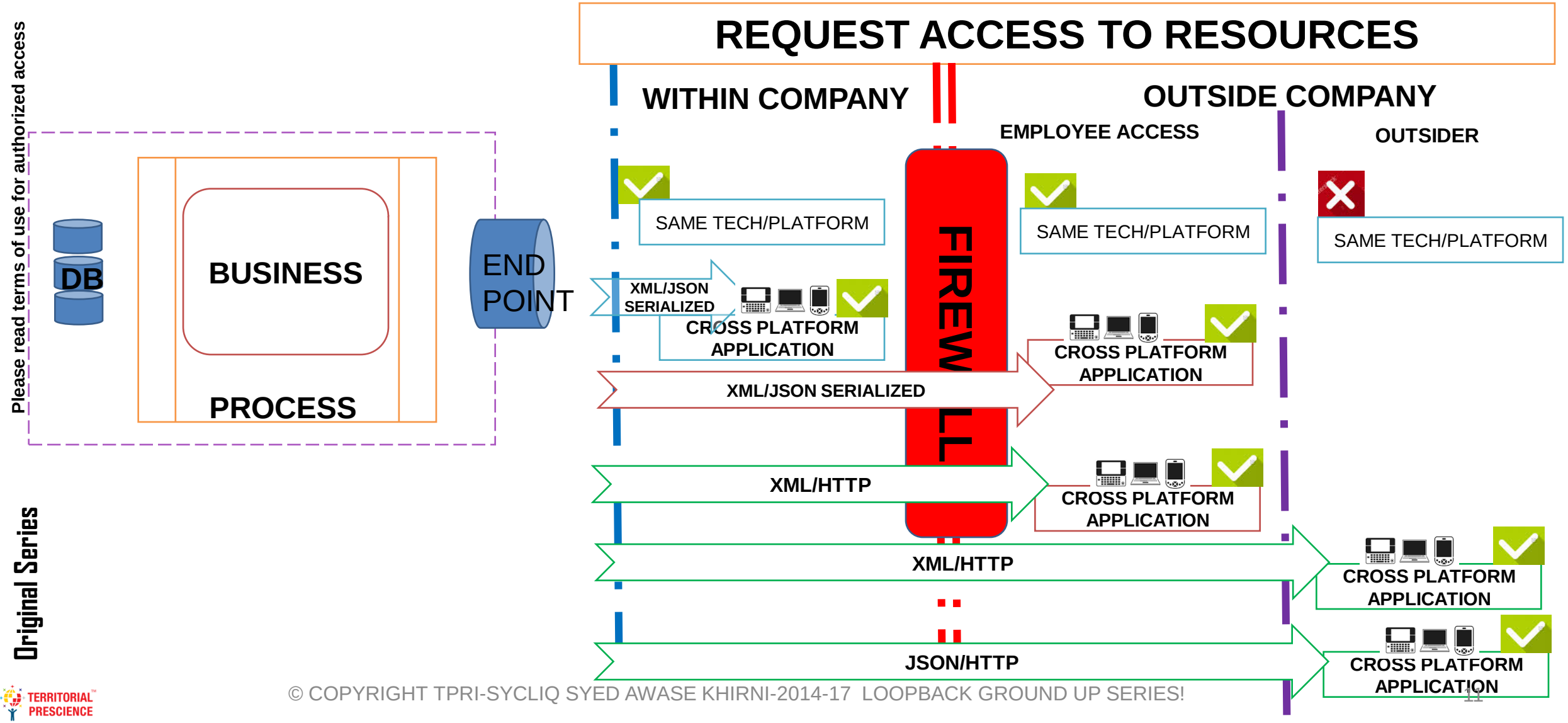


Middleware is any software that acts like a "**glue**" between an application and its network. It controls the flow of information between an application and the server, database and the operating system.

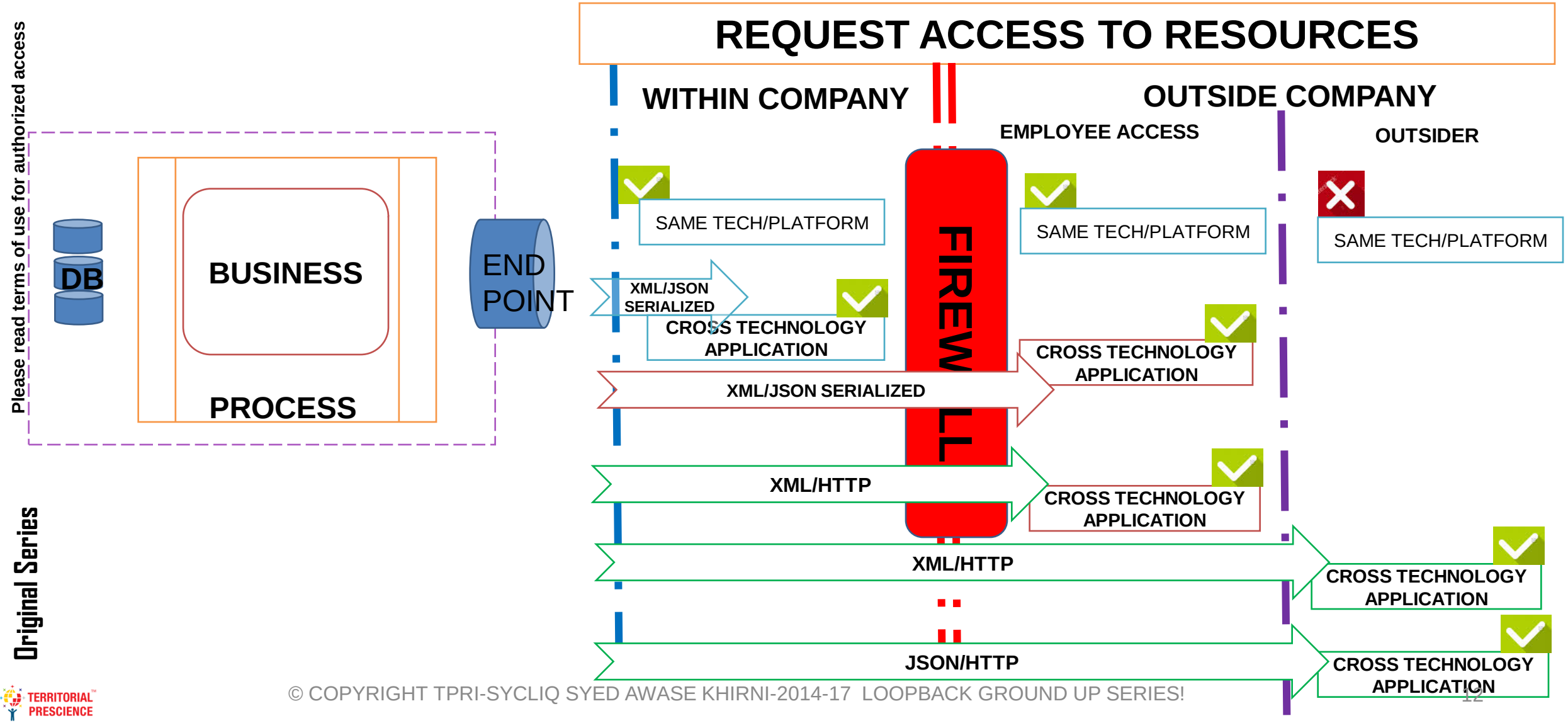
Middleware



Need for Web Services



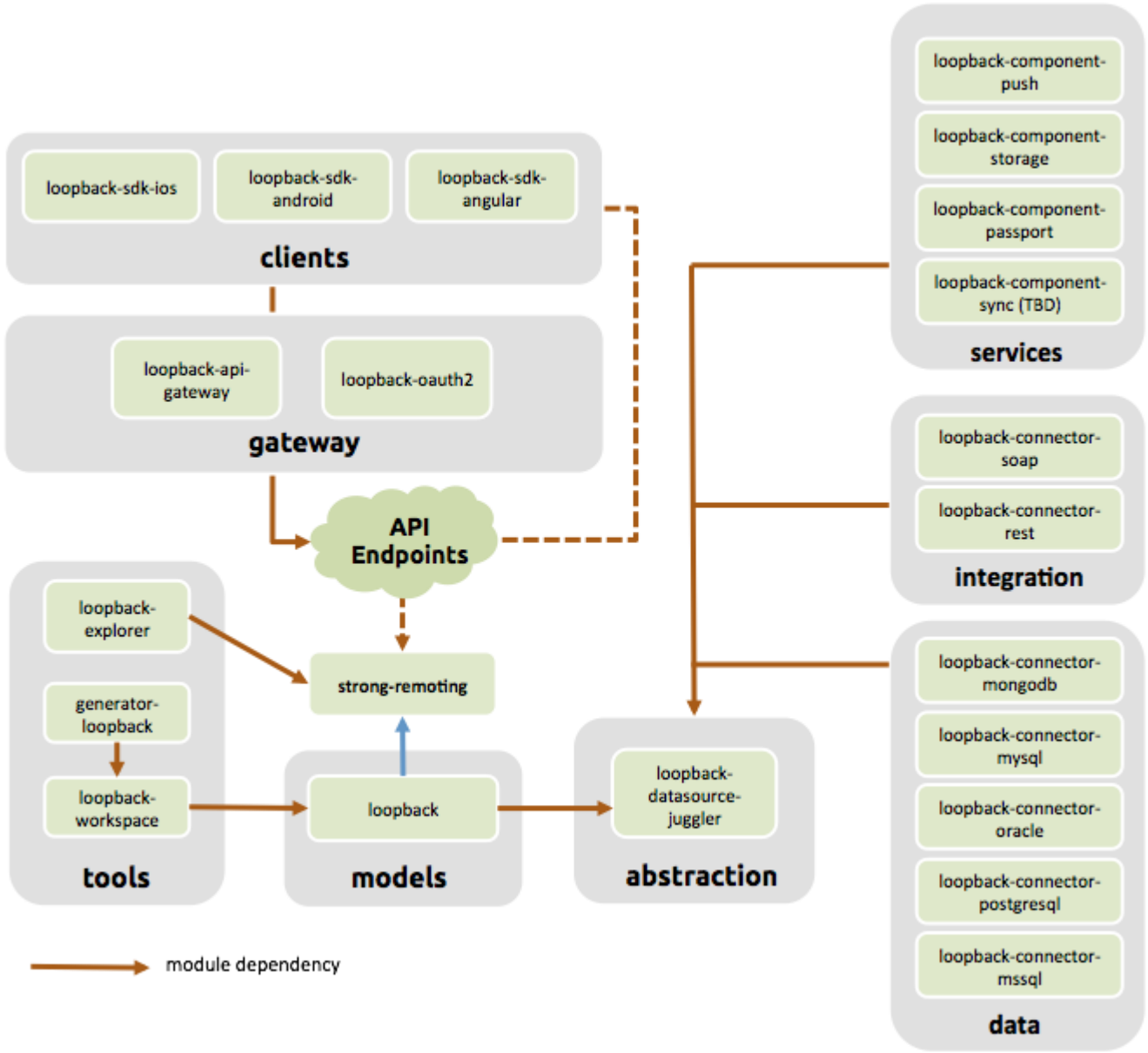
Need for Web Services



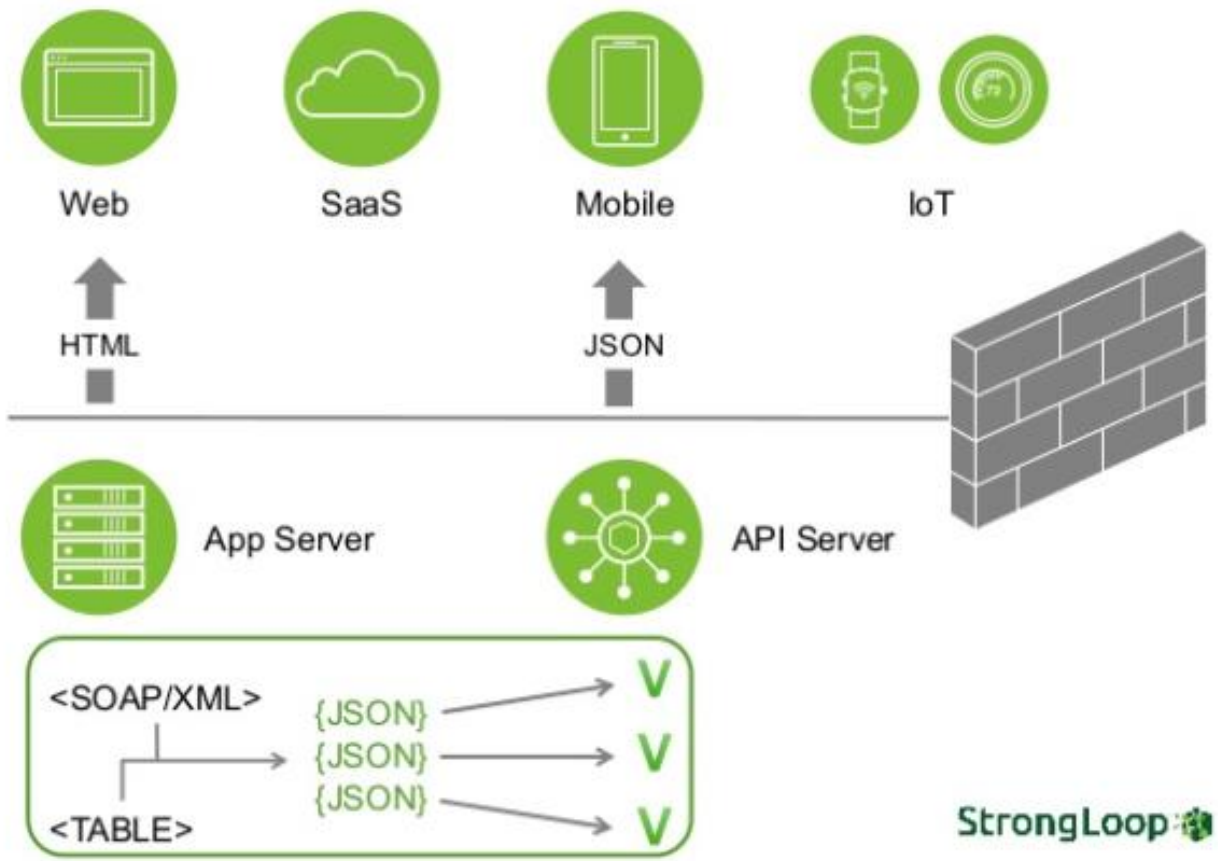
LoopBack

- Create dynamic end-to-end REST APIs with little or no coding.
- Access data from major relational database, MongoDB, SOAP and REST APIs
- Incorporate model relationships and access controls for complex APIs
- Use geolocation, file, and push services for mobile apps.
- Easily create client apps using Android, iOS and JavaScript SDKs
- Run your application on-premises or in the cloud.

LoopBack Architecture

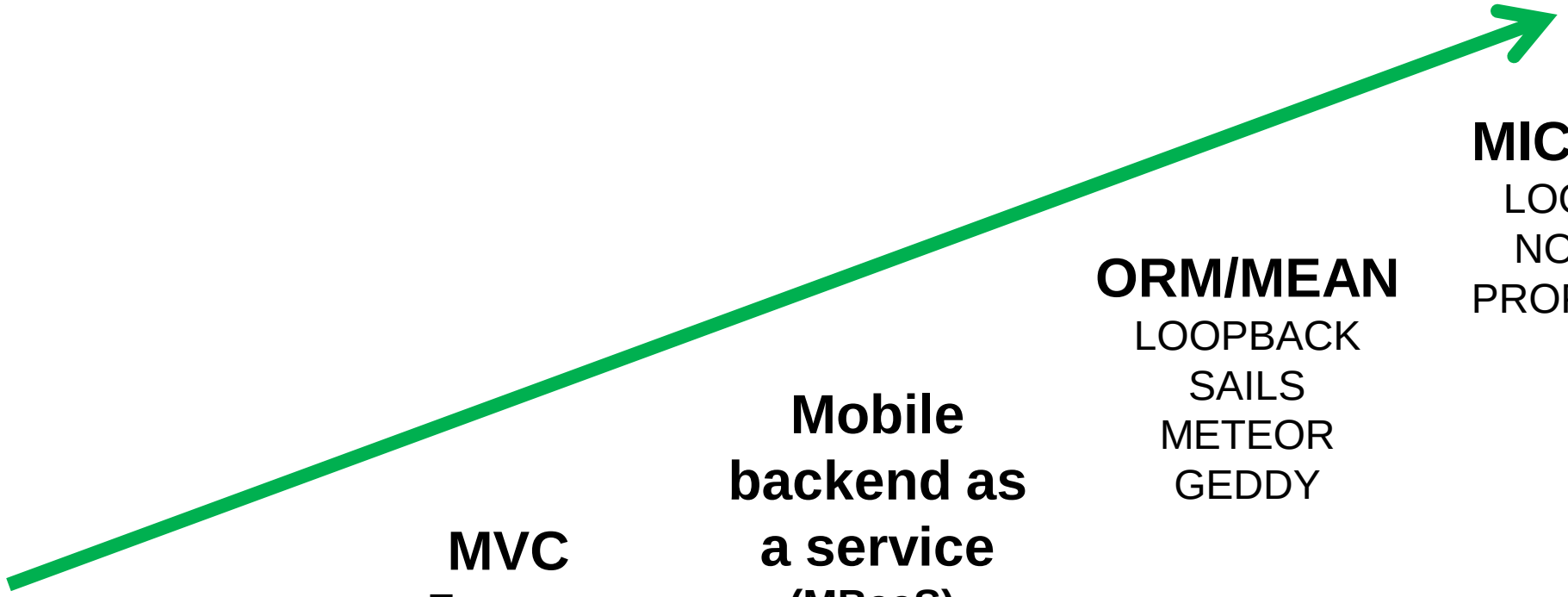


LoopBack API



Frameworks to build WEB API

Evolution of Frameworks



KISS
Callback
Reactor
Observer

MVC
Express
HAPI
RESTIFY
TOTAL
PARTIAL

Mobile backend as a service
(MBaaS),
Loopback
Parse
Meteor
Feedhenry

ORM/MEAN
LOOPBACK
SAILS
METEOR
GEDDY

MICRO/IOT
LOOPBACK
NODERED
PROPRIETARY

LoopBack vs Others

	LoopBack	Express	Hapi	Sails	Restify	Meteor
Type	API Framework	Http Server Library	Http Server Framework	Web MVC Framework	RestHTTP Library	Full stack Javascript App platform
Top Features	Enterprise connectivity, API explorer, generators, client, SDKs, websocket, microservices	HTTP routing, middle ware	Modularity, security	Rails Familiarity, MVC	Simplicity, REST routing	Universal javascript, reactive rendering, web socket, microservices
Suitable For	Webapps, API	Simple web apps	Web apps, APIs	Web apps, APIs	Simple REST APIs	Web apps
Github Stars	8000	29000+	7000+	16000+	6000+	36000+
Support	IBM/Strongloop	IBM/Strongloop	NA	NA	NA	Meteor Development Group

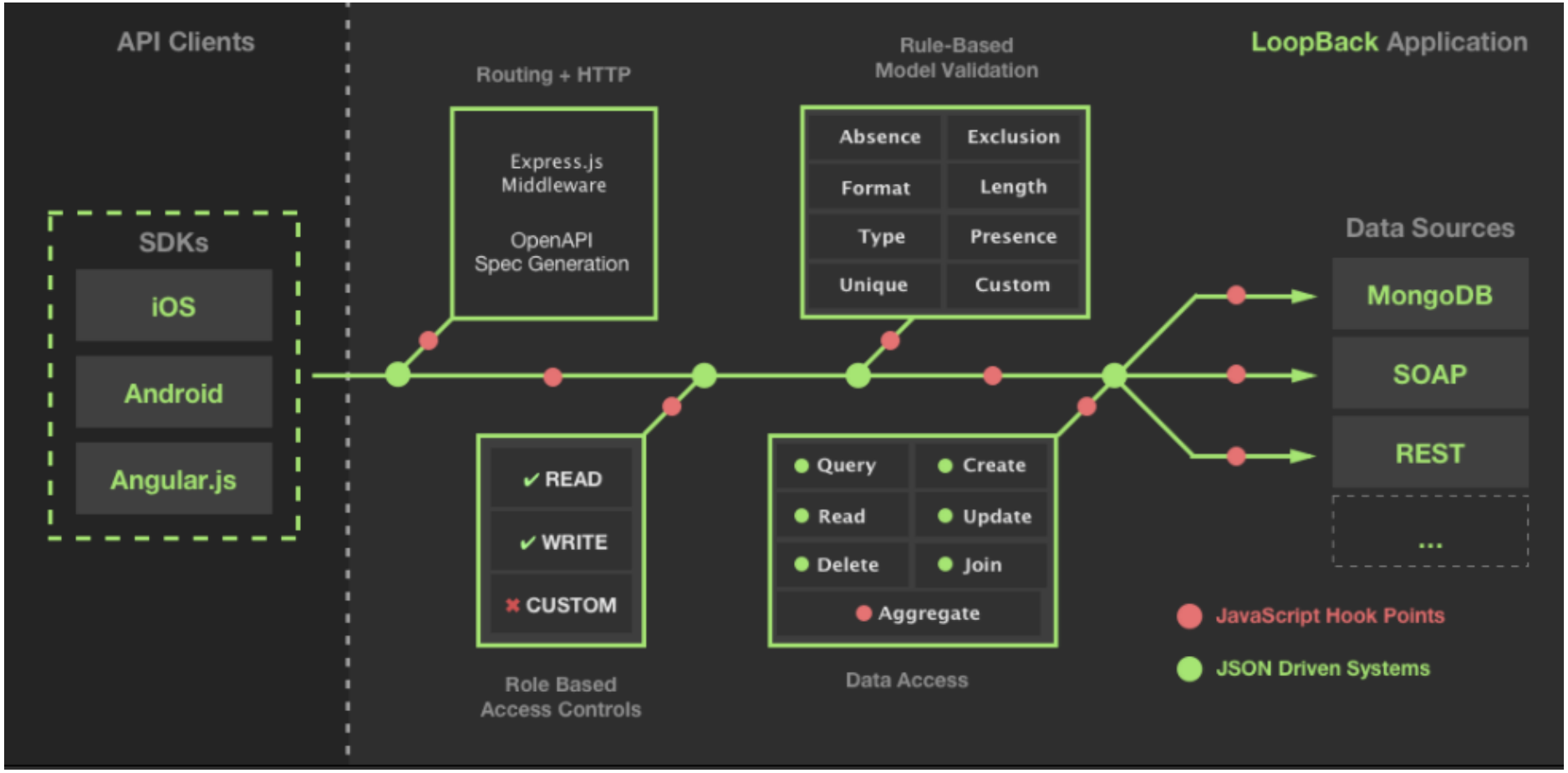
LoopBack vs Others

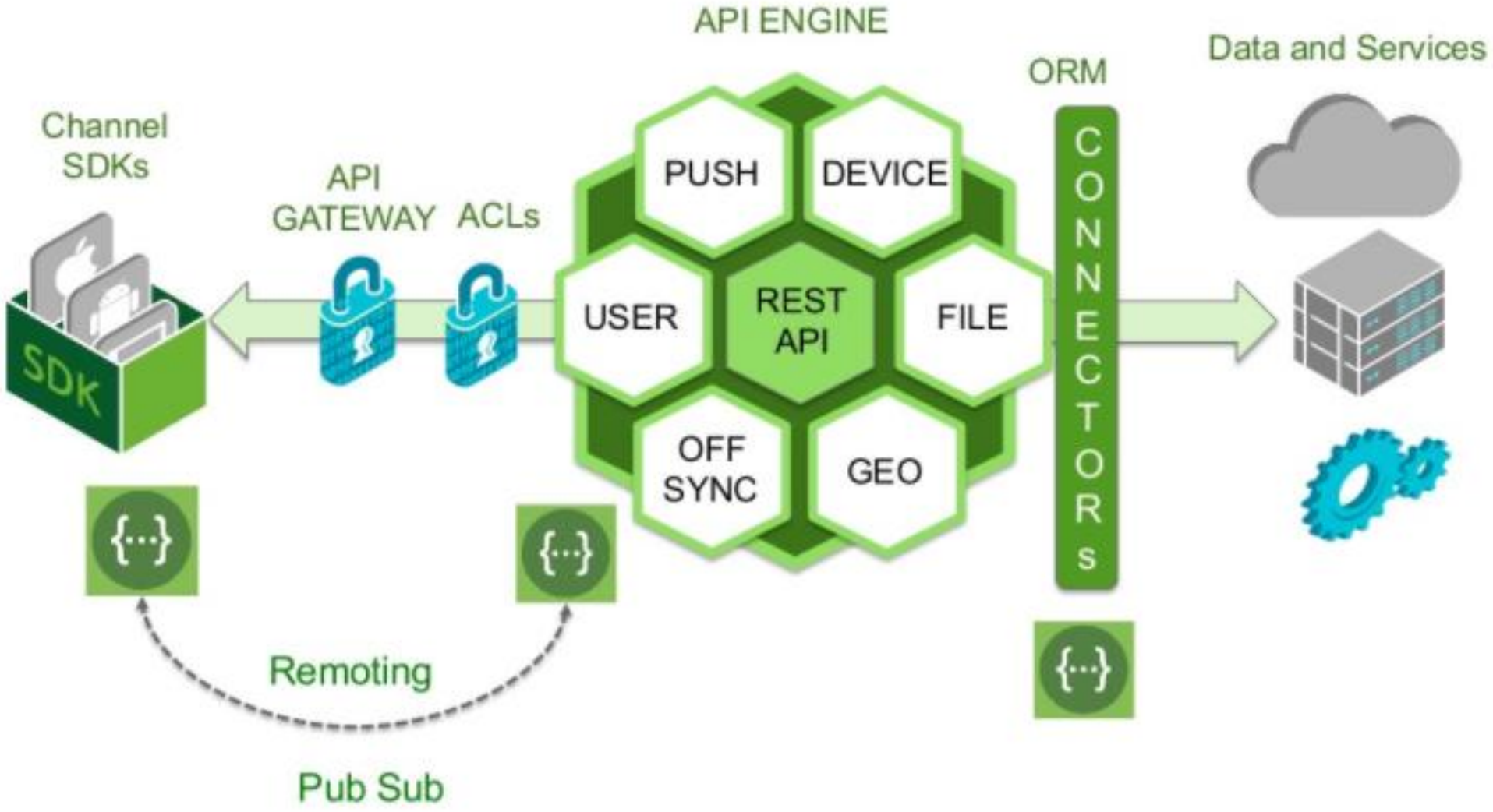
	LoopBack	Express	Hapi	Sails	Restify	Meteor
Pure Node runtime	Yes	Yes	Yes	Yes	Yes	No
Client SDKs	Angular, Browser, Nodejs, iOS, Android, Xamarin	NA	NONE	NONE	NONE	Javascript, cordova for iOS and Android, React, AngularJS
Export API definition	Yes	With strong-remoting	None	None	None	With meteor-rest
Tools	API Explorer, CLI code-generators	CLI app generator	Yeoman generator	Yeoman generator	Yeoman generator	CLI tool
Extensions	Push, File Storage, Passport Oauth 2.0, Express Middleware	Express/Connect middleware	Hapi plugins			Propreitary,package system and repository, npm

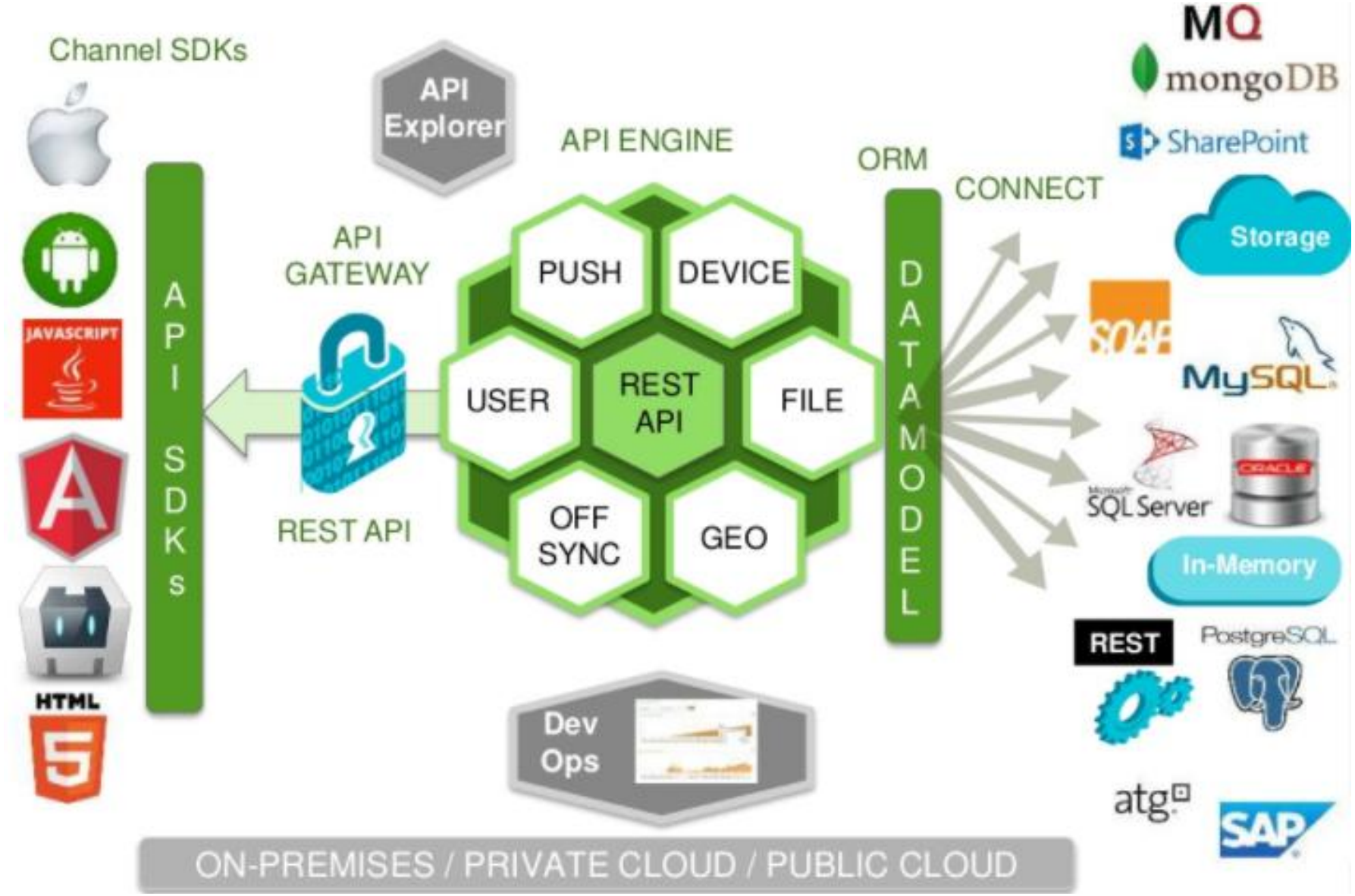
LoopBack vs Others

	LoopBack	Express	Hapi	Sails	Restify	Meteor
Data sources	In-memory/file, mongoDB, MySQL, Oracle, PostgreSQL, SQL Server, ATG, Email, REST, SOAP, many more	None	None	In-memory, File, PostgreSQL, MySQL, MongoDB	None	MongoDB, MySQL and PostgreSQL, via 3rd-aprty packages.
ACLs	Yes	No	No	No	No	Basic allow/deny

A typical LoopBack Application Data Flow



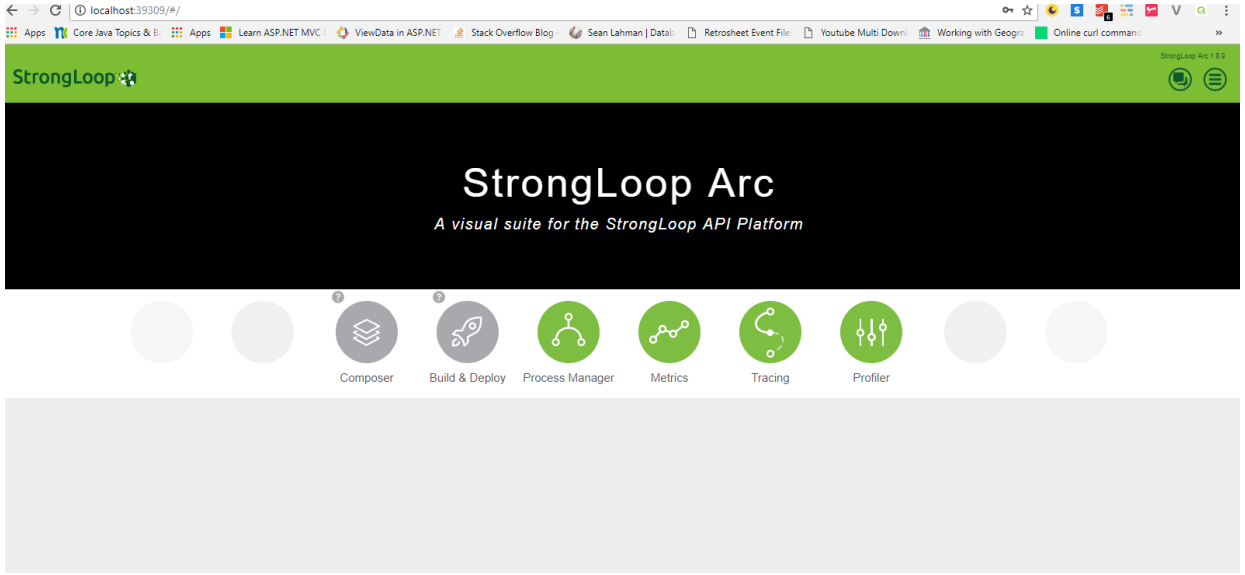




LoopBack STACK

Arc UI: Architect View

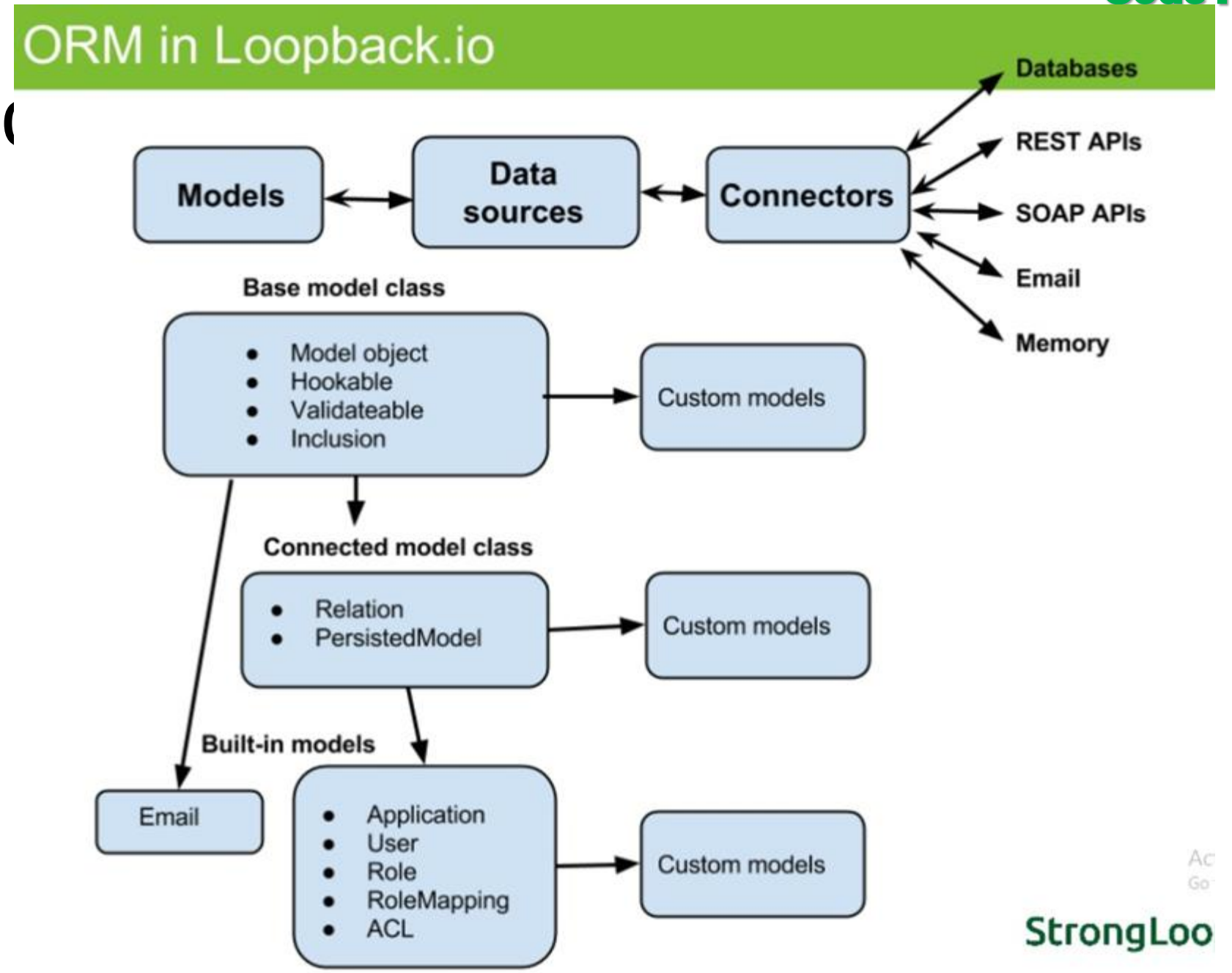
- Widget driven
- Visual composition, management and operations
- Marquee features, evolving platform.
- Deprecated recently in 2015.
- Register with https://developer.ibm.com/apiconnect/
- slc arc => use the login to use arc

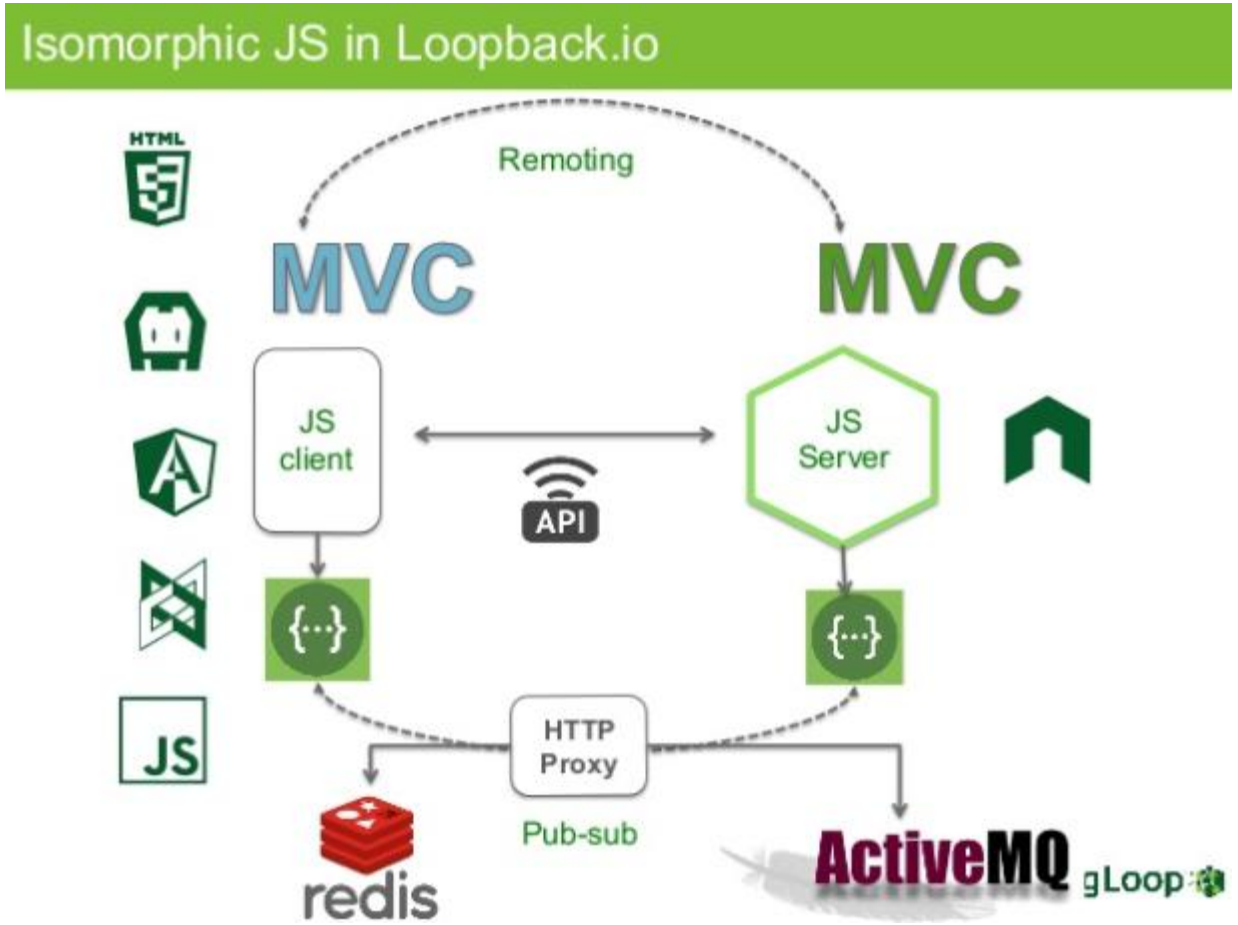


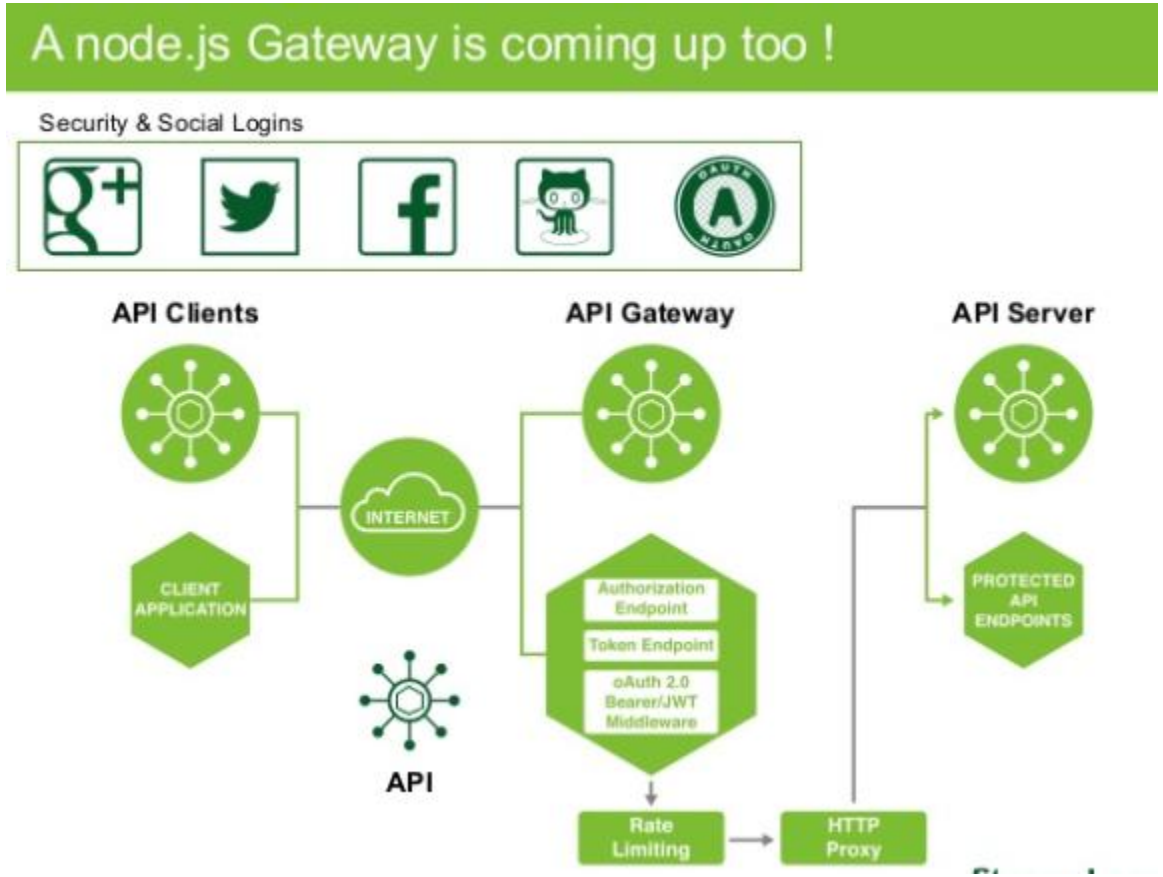
StrongLoop Console (SLC)

- Developer view
- Command line interface
- Full featured
- Greater customization support

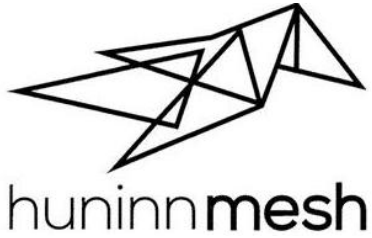
Objec







LoopBack Users



Frameworks built on Express

- Feathers
https://github.com/feathersjs/express
- ItemsAPI
- KeystoneJS
- Kraken
- Lan-stack
- LoopBack
- MEAN
- SAILS

Express	Restify
DIY	DIY
HTTP ROUTING, MIDDLEWARE,TEMPLATING	SIMPLICITY,REST ROUTING
SIMPLE WEB APPS	SIMPLE REST API
COMMERCIAL SUPPORT-STRONGLOOP	JOYENT
CLI APP GENERATOR	YEOMAN GENERATOR
EXPORT API DEFINITION WITH STRONG-REMOTING	SPDY SUPPORT
CONNECT/EXPRESS MIDDLEWARE EXTENSIONS	Dtrace SUPPORT
STRONG LOOP DEVOPS TOOLING SUPPORT	NO EXPORT OF API DEFINITION
MANUAL CRUD ENDPOINTS	NO DATA SOURCE SUPPORT
MANUAL RECURSIVE REFACTORING/TESTING	NO EXTENSIONS OF SIGNIFICANCE
NO DATA SOURCE SUPPORT	MANUAL RECURSIVE REFACTORING/TESTING
NO CLIENT SDK	LIMITED ECOSYSTEM
NO ACL (FINE AUTHORIZATION)	NO ACL(FINE AUTHORIZATION)

HAPI	SAILS
OPINIONATED	OPINIONATED
MODULARITY,SECURITHY, HTTP SERVER CONTROL	WEB MVC FRAMEWORK
COMPLEX WEB APPS, APIS	WEBAPPS, API
COMMERCIAL-SUPPORT-NONE	RAILS FAMILIARITY, MVC
YEOMAN GENERATOR	COMMERCIAL SUPPORT –NONE
NO EXPORT OF API DEFINITION	YEOMAN GENERATOR
HAPI PLUGINS-JOI,BELL,BASSMASTER, ETC	STRONG LOOP DEVOPS TOOLING SUPPORT
LIMITED ECOSYSTEM AS COMPARD TO EXPRESS, SUPPORTS TEMPLATES WITH PLUGINS	NO EXPORT OF API DEFINITIONS
SWAGGER SUPPORT FOR API DOCUMENTATION	LIMITED DATA SOURCES – MYSQL, MONGODB, POSTGRESQL, MEMORY/FILE
VERY LIMITED DATA SOURCE SUPPORT-MONGODB, POSTGRES, LEVELDB	NO EXTENSIONS OF SIGNIFICANCE
NO CLIENT SDK	LIMITED ECOSYSTEM
NO ACL(FINE AUTHORIZATION)	NO ACL(FINE AUTHORIZATION)
	NO CLIENT SDKS

Original Series

LOOPBACK
OPINIONATED
API FRAMEWORK
COMPLEX WEB APPS AND APIS
MODULARITY, SCAFFOLDING AND ENTERPRISE CONNECTIVITY
COMMERCIAL SUPPORT-STRONG LOOP
CLI CODE GENERATOR, VISUAL API COMPOSER, API EXPLORER
EXPORT API DEFINITIONS
EXTENSIONS LIKE PUS, FILE STORAGE, PASSPORT, Oauth 2.0, Express Middleware
VAST CONNECTOR ECOSYSTEM AND EXTENDED EXPRESS
AUTO CRUD
SWAGGER UI AND CODE GENERATOR
DATA SOURCES LIKE MONGO, MYSQL, ORACLE, SOAP, REST, SQL SERVER, MEMORY/FILE, POSTGRESQL, EMAIL, ATG, COUCHBASE, APACHE KAFKA, AND MANY MORE.
CLIENT SDK – ANGULAR, BROWSER, IOS, ANDROID, NODE.JS
MATURE ACL(FINE AUTHORIZATION),API GATEWAY

Express

•All end points need to be created manually, you end up doing a lot of the same code (or worse, start rolling your own libraries after a while)

•Every end point needs to be tested (or at the very least I recommend that you hit the end points with HTTP consumer to make sure they are actually there and don't throw 500s)

•Refactoring becomes painful because everything needs to be updated everywhere

•Doesn't come with anything "standard", have to figure out your own approach

LoopBack

•Very quick RESTful API development

•Convention over configuration

•Built in models ready to use

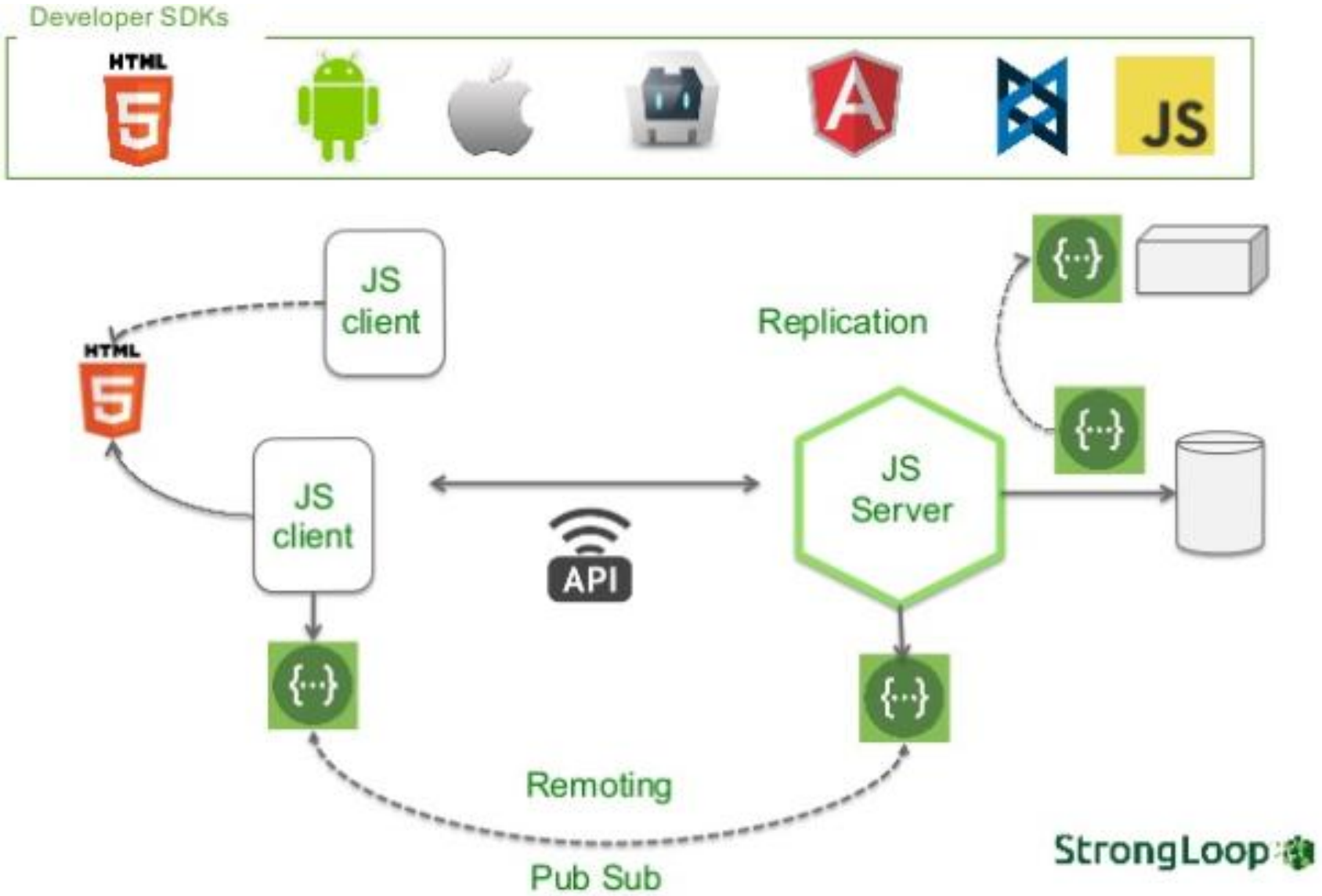
•RPC support

•Fully configurable when needed

•Extensive documentation

•Fulltime team working on the project

•Available commercial support



LoopBack Features

- Powerful ACLs
- Good core code quality
- Secure with baked in cross XSS
- Isomorphic model definitions
- Authentication, Authorization and Permissions.
- Clean separation between API server and client
- Baked in mobile and client SDKs
- Good Suite of surrounding enterprise tools like
  - StrongLoop Arc
  - Visual API composer
  - CLI code generators etc
- Third-party login
- Features like Storage Component, Push Notifications, Oauth Server

LoopBack

- Built on Top of Express
- Optimized for APIs
- Model Driven Architecture
- Enterprise Superglue
- Full Stack
- e2e SDLC Tooling

LoopBack Components

- LoopBack components are predefined packages that extend a basic loopback application.
- A component is related code bundled together as a unit to enable loopback applications for easy reuse.
- We can configure components declaratively in component-config.json.
- A loopback application is nothing more than a group of components with elements to tie them all together.

Component	Description
API Explorer	Enables the Swagger UI for the API
OAuth 2.0	Enables LoopBack applciations to function as Oauth 2.0 providers to authenticate and authorize client applications and users to access protected API end points
Push Notifications	Adds push notification capabilities to your loopback application as a mobile backend service
Storage component	Adds an interface to abstract storage providers like S3, filesystem into general containers and files
Synchronization	Adds replication capability between LoopBack running in a browser or between LoopBack back-end instances to enable offline synchronization and server-to-server data synchronization
Third-party login using Passport	Adds third-party login capabilities to your LoopBack application like Facebook, GitHub etc..

IBM API Connect

DaveYVR commented on May 16

In early 2016 the StrongLoop team announced that Arc would reach its end of life within a year. That year has passed, and Arc has been replaced by API Connect. New users cannot register for Arc, and we recommend interested users try out the Essentials edition of API Connect. If you have questions about API Connect, please email reachsl@us.ibm.com or visit this site:

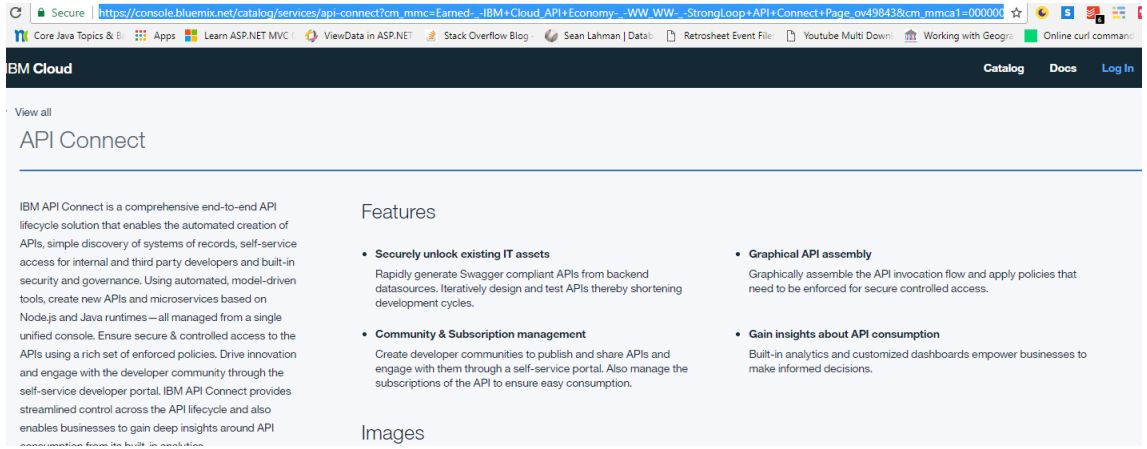
https://console.ng.bluemix.net/catalog/services/api-connect?cm_mmc=Earned-_-IBM+Cloud_API+Economy-_-WW_WW-_-StrongLoop+API+Connect+Page_ov49843&cm_mmca1=000000WT&cm_mmca2=10002833&

You can also try LoopBack, our Open Source node framework:

http://loopback.io/

Thanks for reaching out.

https://console.bluemix.net/catalog/services/api-connect?cm_mmc=Earned-_-IBM+Cloud_API+Economy-_-WW_WW-_-StrongLoop+API+Connect+Page_ov49843&cm_mmca1=000000WT&cm_mmca2=10002833&=



SYED AWASE KHIRNI

LoopBack: Installation

COMMAND LINE INSTALLATION

http://www.nodejs.org install LTS Version

```
$ npm install -g loopback-cli

$ npm install -g strongloop

$ slc --help

$ slc loopback getting-started-node-loopback
```

Datastorage: MySQL,MongoDB,IBM UDB DB2, PostgreSQL,MySQLServer

LoopBack Application Structure

File Name	Description
Package.json	Development packages installed by npm
Common/models	Definition of basic models provided by loopback
Server/server.js	Main application file
Server/cofig.json	Machine-editable app configuration
Server/datasources.json	Definition of data sources
Server/model-config.json	Model configuration file
Server/middleware	Middleware configuration

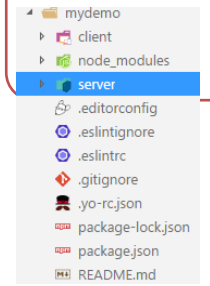
Loopback Generators

Command	Description
Slc loopback:acl	Access control list
Slc loopback:app	Creating a loopback application
Slc loopback:boot-script	Bootscript for your application
Slc loopback:datasource	Datasource configuration
Slc loopback:export-api-def	Export api definitions
Slc loopback:model	Model definitions, properties and property type
Slc loopback:property	Defining property to an existing loopback model
Slc loopback:remote-method	Defining custom remote methods
Slc loopback:swagger	

Loopback Workflow

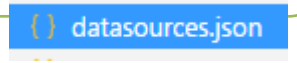
Scaffold (slc loopback appname)

- Select version (2.x or 3.x)
- Type of Application
  - API-SERVER
  - EMPTY-SERVER
  - HELLO-WORLD
  - NOTES



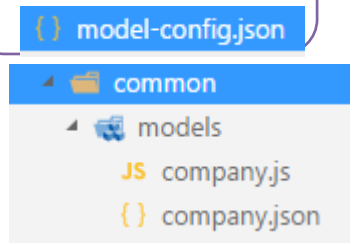
Connect to datasource (slc loopback:datasource)

- Name
- ConnectorType
- ConnectorConfiguration
- Data configurator



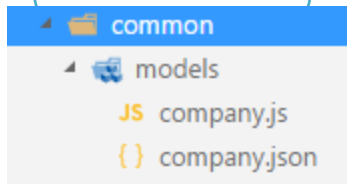
Create models (slc loopback: model

- Model name
- Datasource to be attached to
- Model base class type
- Expose model via REST API? (BOOLEAN) writes to server/model-config.json



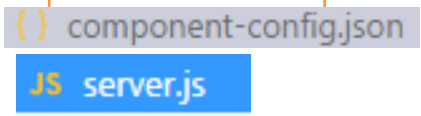
Create model relations (slc loopback: relation)

- Select the model to relate to
- Identify relationship type



Run your server api using node .

- Open explorer api in the browser
- http://localhost:3000/explorer

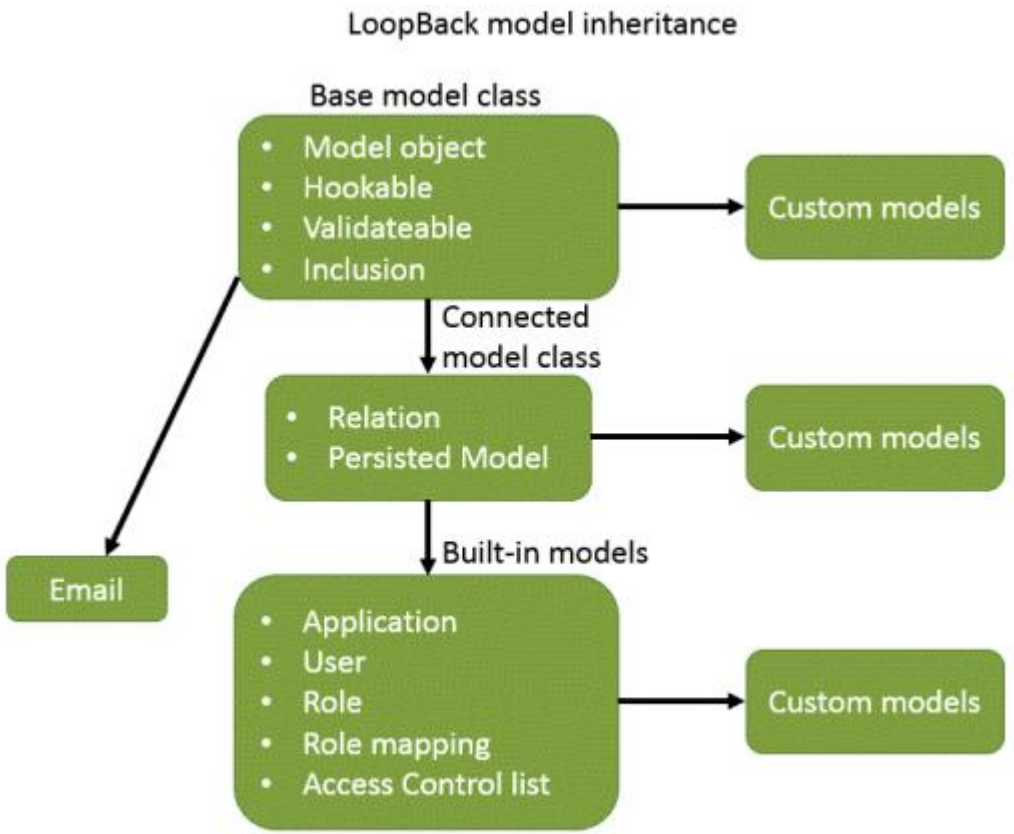


LoopBack built-in models

- Application model: contains metadata for a client application that has its own identity and associated configuration with the LoopBack Server.
- User model: used to register and authenticate users of your app locally or against third-party services.
- Access control models – ACL, access Token, Scope, Role and RoleMapping models for controlling access to applications, resources, and methods.
- Email model: send emails to app users using SMTP or third-party services.

- All models except for Email extend PersistedModel.
- Access Control Models
  - ACL
  - AccessToken
  - Scope
  - Role
  - RoleMapping

LoopBack Model Inheritance

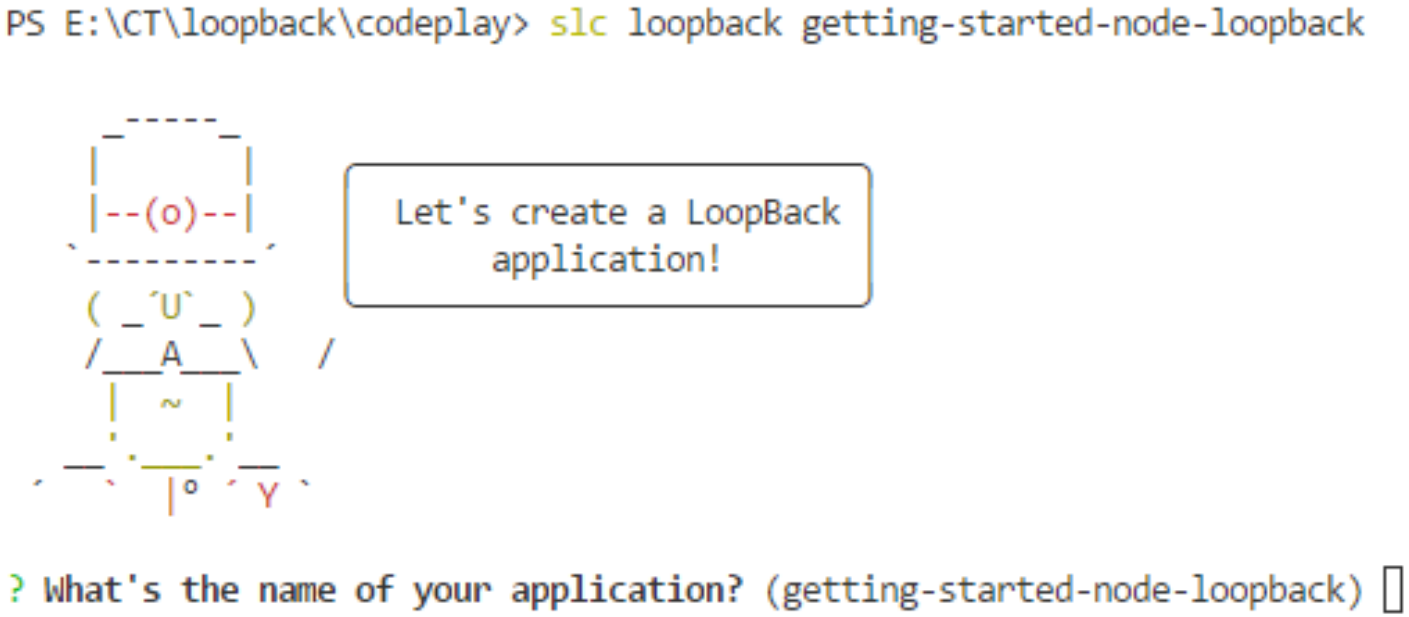


Hello World Application

SLC LOOPBACK:DEMO-II

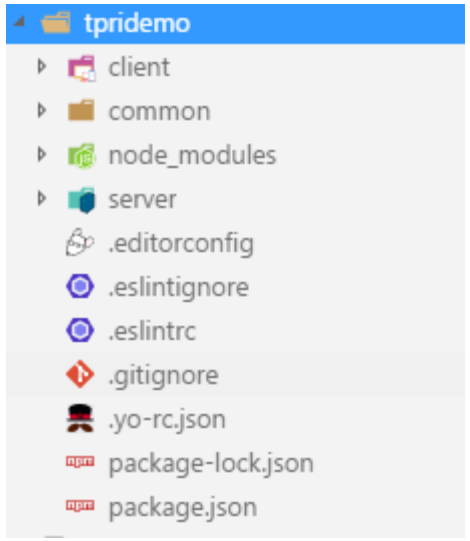
SLC Successful

- Upon on successful installation of loopback/strongloop



1.Basic working example

- Navigate through menu options on command line to create a basic working application as shown in the figure.




```
PS E:\CT\loopback\codeplay> slc loopback getting-started-node-loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y ` 

? What's the name of your application? tpridemo
? Enter name of the directory to contain the project: tpridemo
   create tpridemo/
     info change the working directory to tpridemo

? Which version of LoopBack would you like to use? 2.x (long term support)
? What kind of application do you have in mind? notes (A project containing a basic working example, including a memory database)
Generating .yo-rc.json


I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.


   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create common\models\note.js
   create common\models\note.json
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd tpridemo

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

2. Running your application.

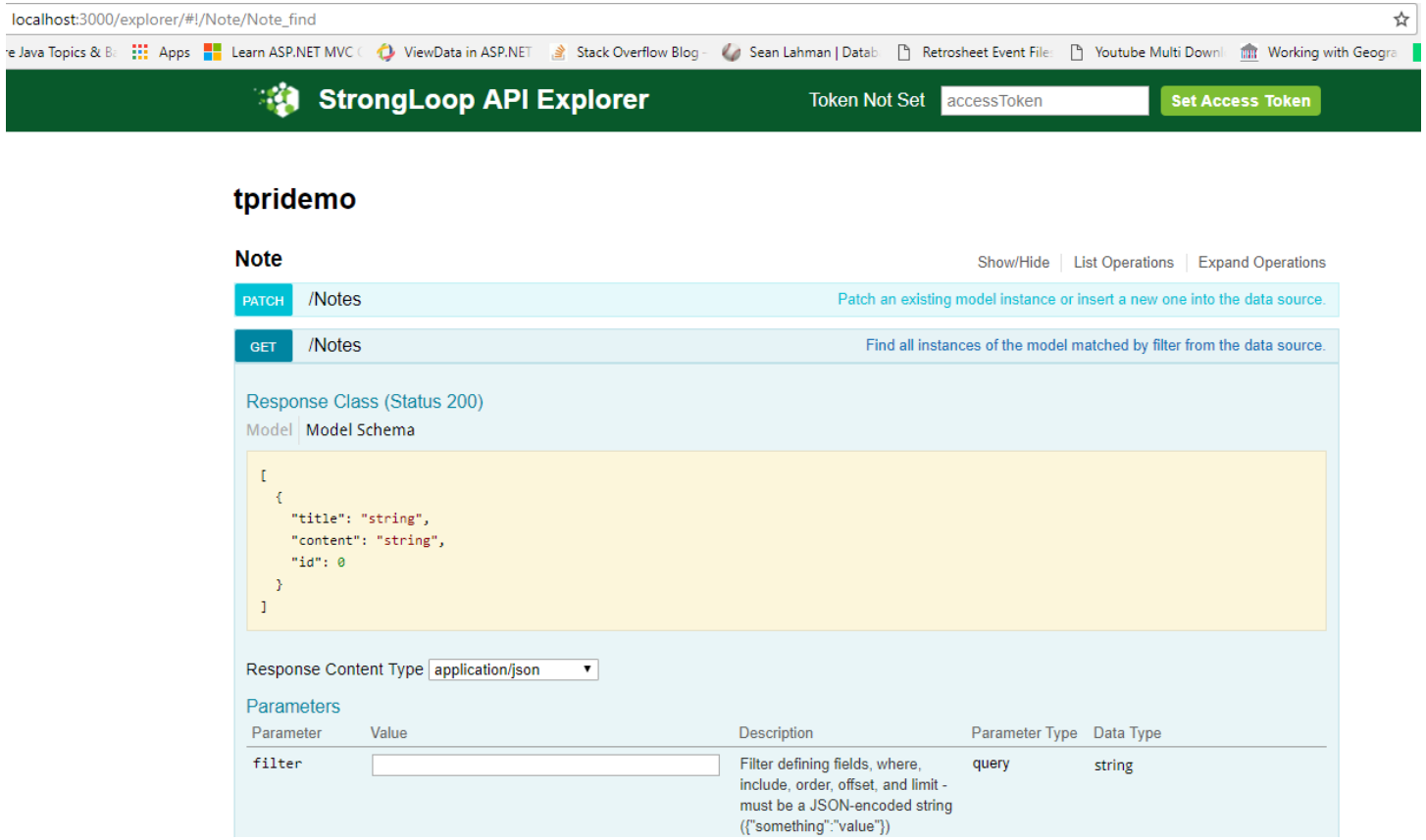
- navigate to the directory where your application has been installed
- Run you application with **node .**

```
PS E:\CT\loopback\codeplay> cd tpridemo
PS E:\CT\loopback\codeplay\tpridemo> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```

3. Browser view

- navigate to the directory where your application has been installed
- Run you application with **node .**

http://localhost:3000/explorer/



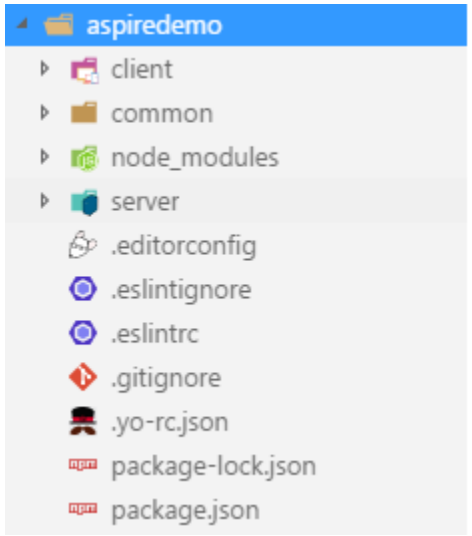
HELLOWORLD APPLICATION

SLC LOOPBACK:DEMO-III

Step 1

Hello World Application

- Create another loopback application with current version **3.x**
- Hello world application with controller.




```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? aspiredemo
? Enter name of the directory to contain the project: aspiredemo
   create aspiredemo/
     info change the working directory to aspiredemo

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? hello-world (A project containing a controller, including a single vanilla Message and a single remote method)
Generating .yo-rc.json


I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.


   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create common\models\message.js
   create common\models\message.json
   create server\boot\authentication.js
   create .gitignore
   create client\README.md
npm WARN deprecated nodemailer@2.7.2: All versions below 4.0.1 of Nodemailer are deprecated. See https://nodemailer.com/status/

 Next steps:

   Change directory to your app
     $ cd aspiredemo

   Create a model in your app
     $ slc loopback:model

   Run the app
     $ node .
```

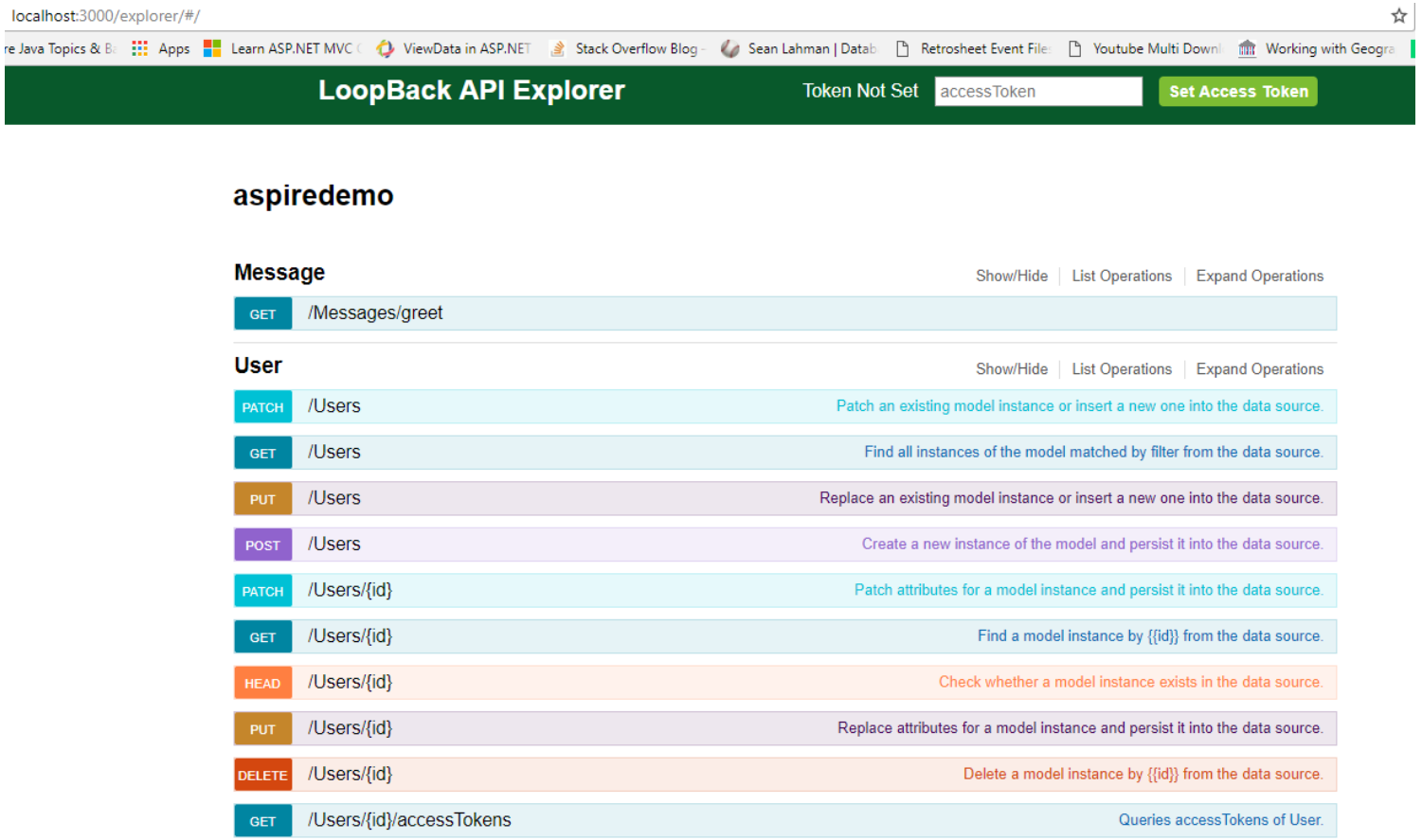
Step 2

Hello World Application

- change to the aspiredemo directory
- Run your application node .

```
PS E:\CT\loopback\codeplay\aspiredemo> node .
strong-remoting deprecated Remoting metadata "isStatic" is deprecated. Please specify "prototype.name" in method name instead for isStatic=false. <anonymous>:null:null
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```

http://localhost:3000/explorer/#/



EMPTY LOOPBACK APPLICATION

SLC LOOPBACK:DEMO-III

Step 1

Empty LoopBack Application

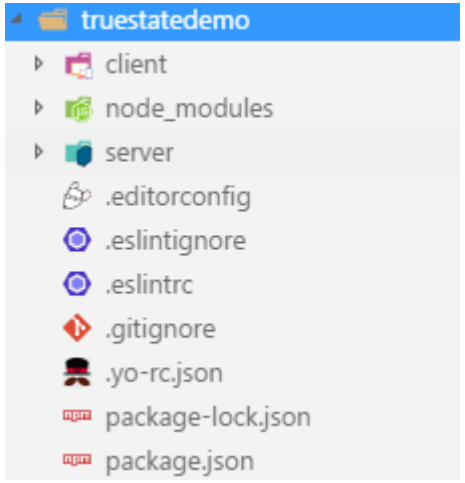
- create another loopback application with empty selection as shown in the figure with current version 3.x

```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    .--------------------------.
   `---------´   |  Let's create a LoopBack  |
    ( _´U`_ )    |       application!       |
    /___A___\    '--------------------------'
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? truestatedemo
? Enter name of the directory to contain the project: truestatedemo
   create truestatedemo/
     info change the working directory to truestatedemo

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? empty-server (An empty LoopBack API, without any configured models or datasources)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd truestatedemo

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

Step 2

Empty LoopBack Application

- change to the truestatedemo directory
- Run your application with node .




```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? truestatedemo
? Enter name of the directory to contain the project: truestatedemo
   create truestatedemo/
     info change the working directory to truestatedemo

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? empty-server (An empty LoopBack API, without any configured models or datasources)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd truestatedemo

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

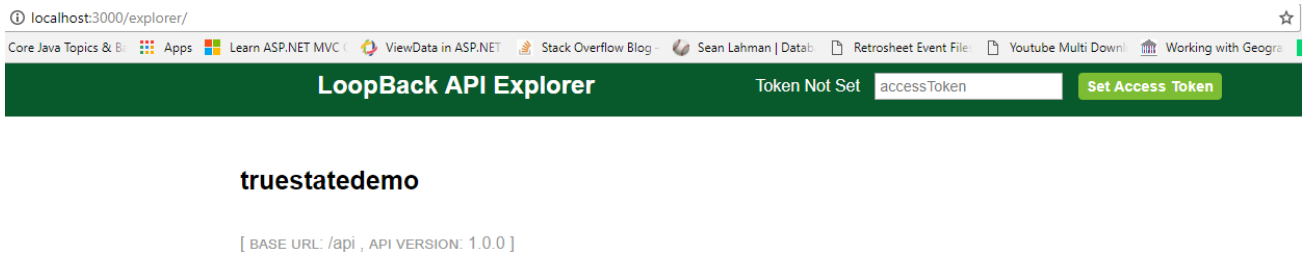
Step 3

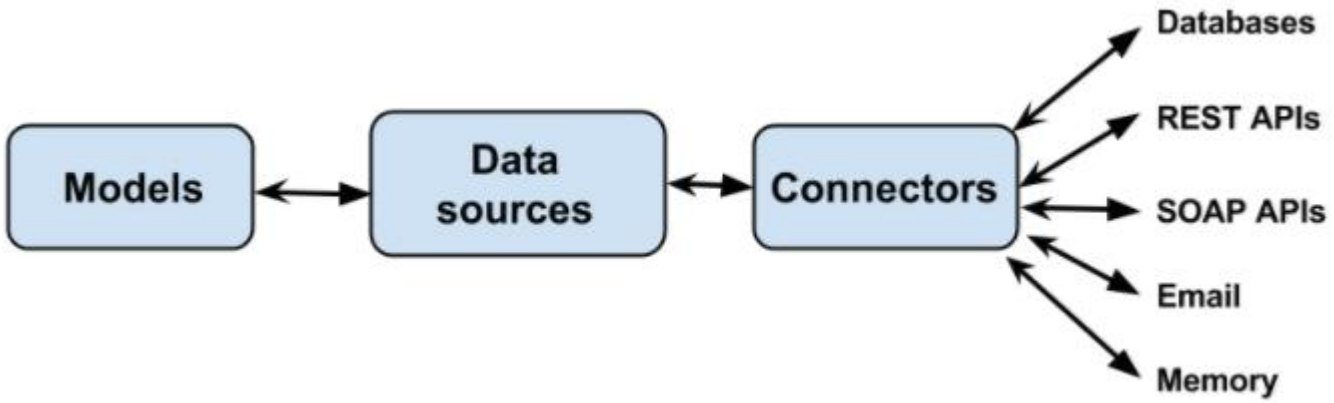
Empty LoopBack Application

- open browser view http://localhost:3000/explorer/

```
PS E:\CT\loopback\codeplay> cd .\truestatedemo\
PS E:\CT\loopback\codeplay\truestatedemo> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```

http://localhost:3000/explorer/





BANK DEMO WITH MONGODB

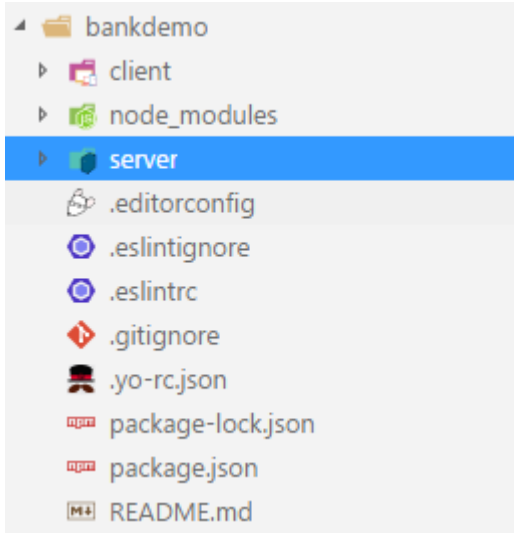
SLC LOOPBACK:DEMO-IV

BANK DEMO

Step 1

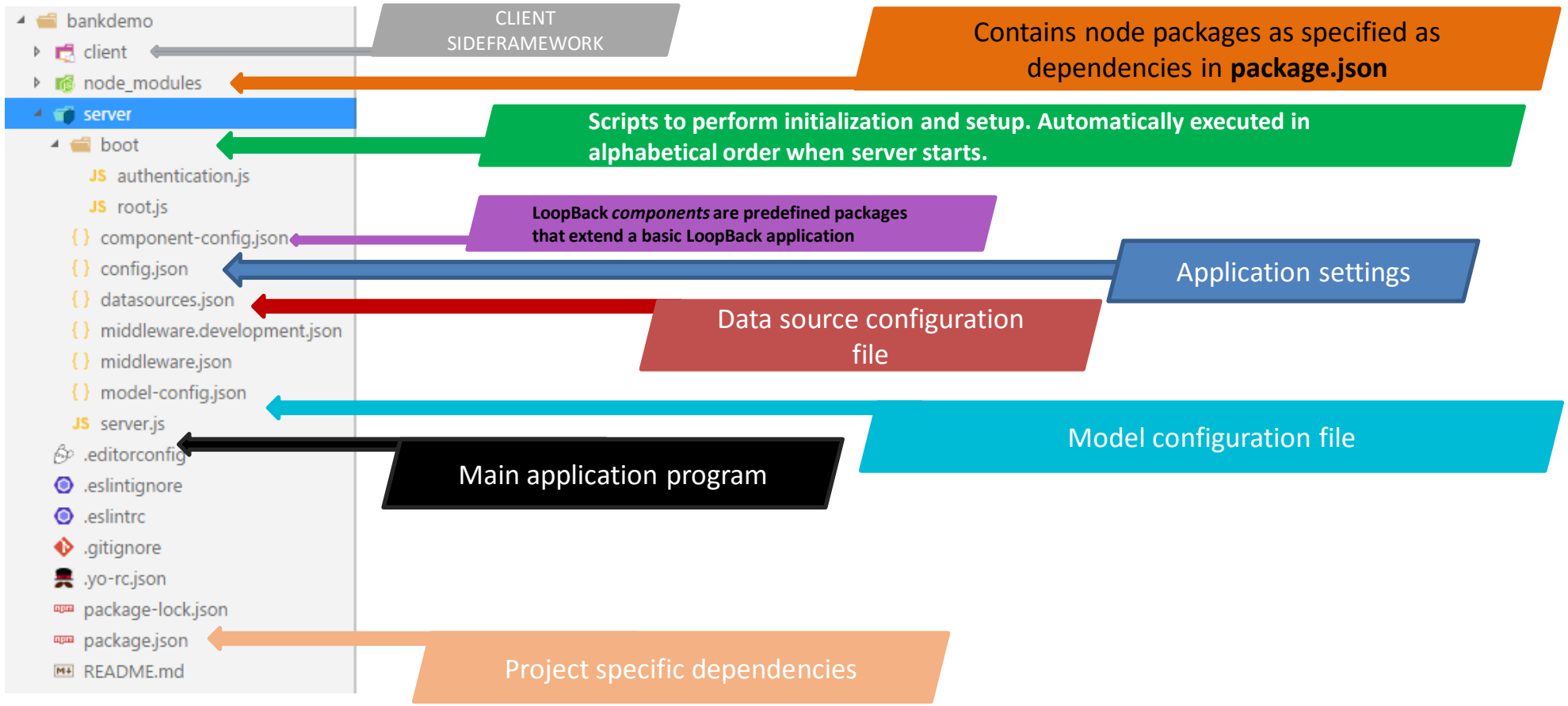
Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? bankdemo
? Enter name of the directory to contain the project: bankdemo
   create bankdemo/
     info change the working directory to bankdemo

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json

Next steps:

  Change directory to your app
    $ cd bankdemo

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

API Server Project Folder



BANK DEMO

Step 2

```
$ npm install --save loopback-connector-mongodb
```

Install slc loopback:datasource

- configure your loopback to MongoDB as datasource for persistent storage.

```
PS E:\CT\loopback\codeplay> cd .\bankdemo\
PS E:\CT\loopback\codeplay\bankdemo> slc loopback:datasource
? Enter the data-source name: bankdemo
? Select the connector for bankdemo: MongoDB (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: mongodb://username:password@hostname:port/database): mongodb://@localhost:27017/bankloop
? host: localhost
? port: 27017
? user:
? password:
? database: bankloop
? Install loopback-connector-mongodb@^1.4 Yes
+ loopback-connector-mongodb@1.18.1
added 14 packages in 8.835s
```

BANK DEMO

Step 3

slc loopback:model

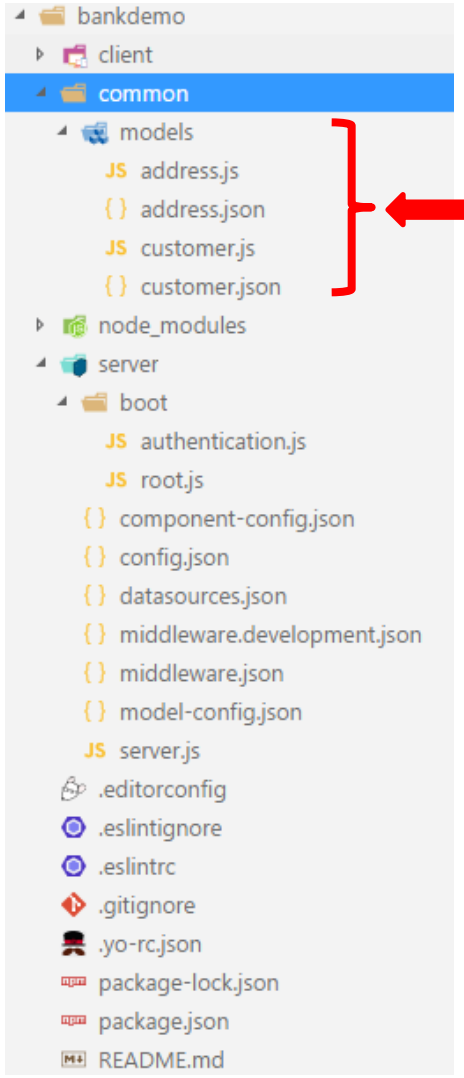
- create required models for rendering the API.
- customer model and address model

```
PS E:\CT\loopback\codeplay\bankdemo> slc loopback:model
? Enter the model name: Customer
? Select the data-source to attach Customer to: bankdemo (mongodb)
? Select model's base class PersistedModel
? Expose Customer via the REST API? Yes
? Custom plural form (used to build REST URL): customers
? Common model or server only? common
Let's add some Customer properties now.

Enter an empty property name when done.
? Property name: name
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another Customer property.
Enter an empty property name when done.
? Property name: age
   invoke   loopback:property
? Property type: number
? Required? Yes
? Default value[leave blank for none]:

Let's add another Customer property.
Enter an empty property name when done.
? Property name: email
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another Customer property.
Enter an empty property name when done.
? Property name:
```

```
PS E:\CT\loopback\codeplay\bankdemo> slc loopback:model
? Enter the model name: Address
? Select the data-source to attach Address to: bankdemo (mongodb)
? Select model's base class PersistedModel
? Expose Address via the REST API? Yes
? Custom plural form (used to build REST URL): addresses
? Common model or server only? common
Let's add some Address properties now.

Enter an empty property name when done.
? Property name: streetname
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another Address property.
Enter an empty property name when done.
? Property name: city
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another Address property.
Enter an empty property name when done.
? Property name: state
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another Address property.
Enter an empty property name when done.
? Property name: country
```

PersistedModel is the base object for all models connected to a persistent data source such as a database

BankDemo verifying common models created



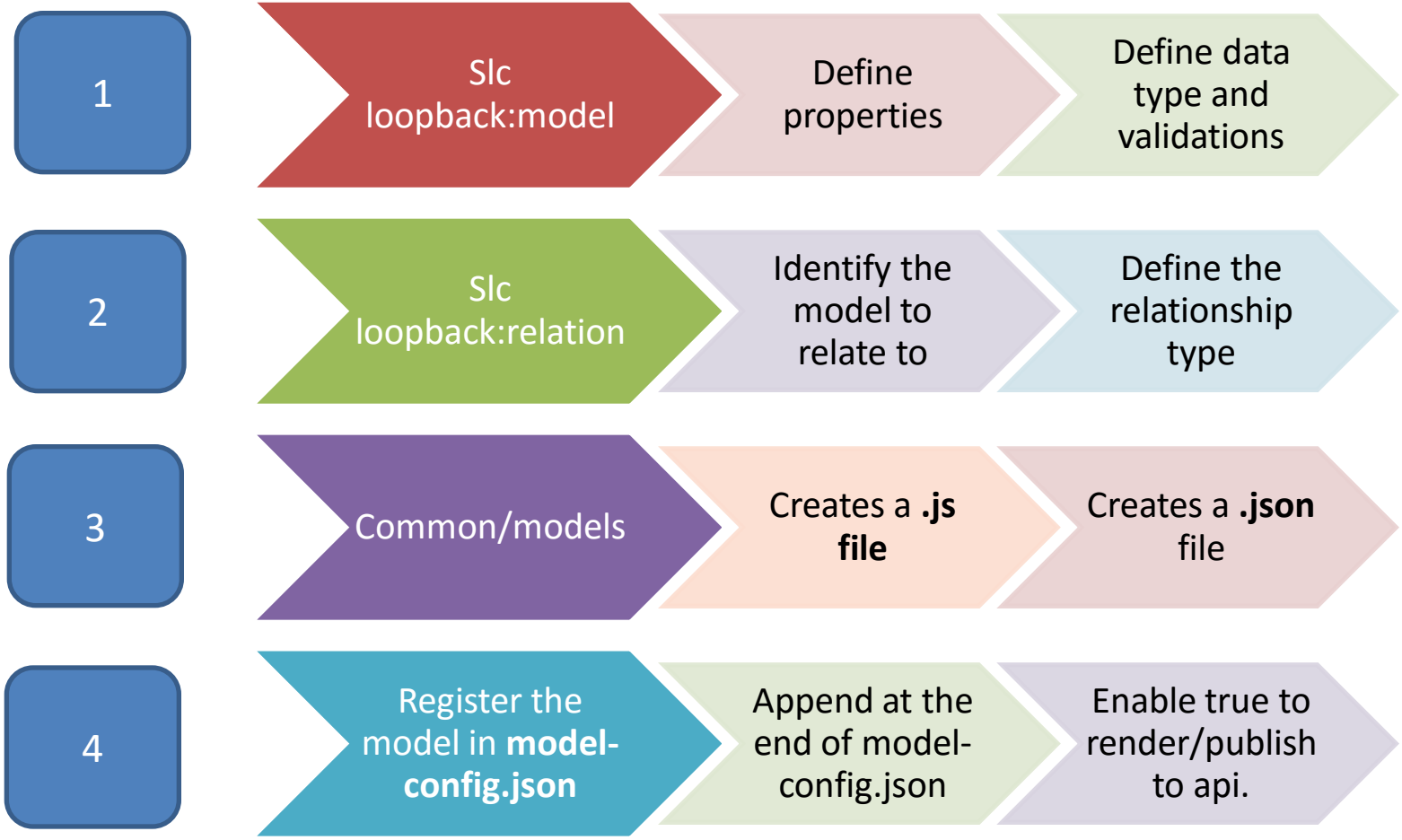
- create **common/models** folder inside bankdemo

Stores Custom model files:

· Model definition JSON files, by convention named *model-name*.json; for example customer.json.

· Custom model scripts by convention named *model-name*.js; for example, customer.js.

LoopBack models workflow



BANK DEMO

Step 4

slc loopback:relation

- A customer **“has many”** addresses.
- loopback enables us to define relationship between two entities using slc loopback:relation as shown in the figure.

```
PS E:\CT\loopback\codeplay\bankdemo> slc loopback:relation
? Select the model to create the relationship from: Customer
? Relation type: has many
? Choose a model to create a relationship with: Address
? Enter the property name for the relation: addresses
? Optionally enter a custom foreign key:
? Require a through model? No
```

BANK DEMO

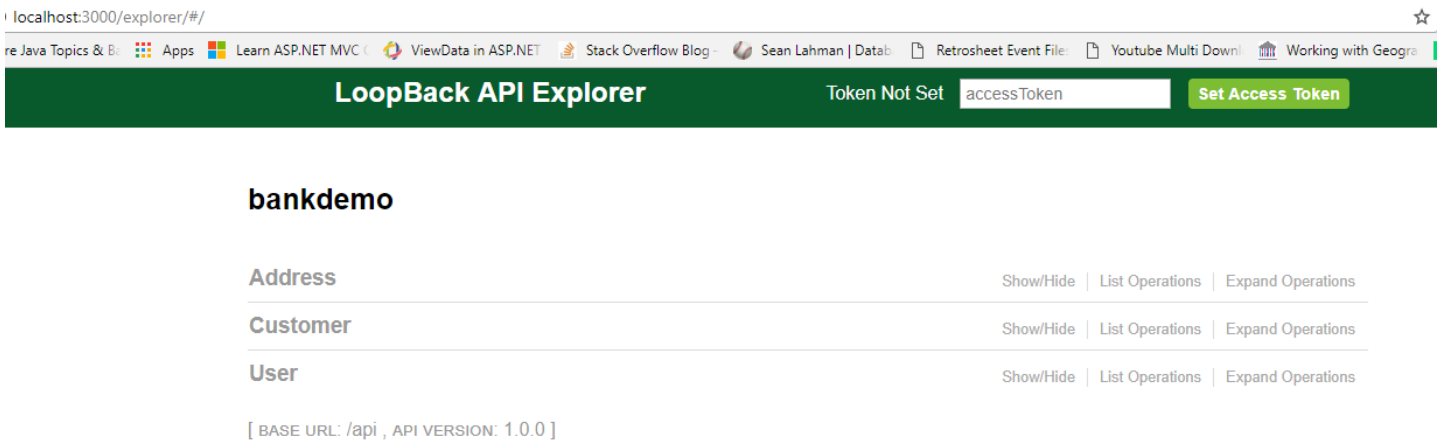
Step 5

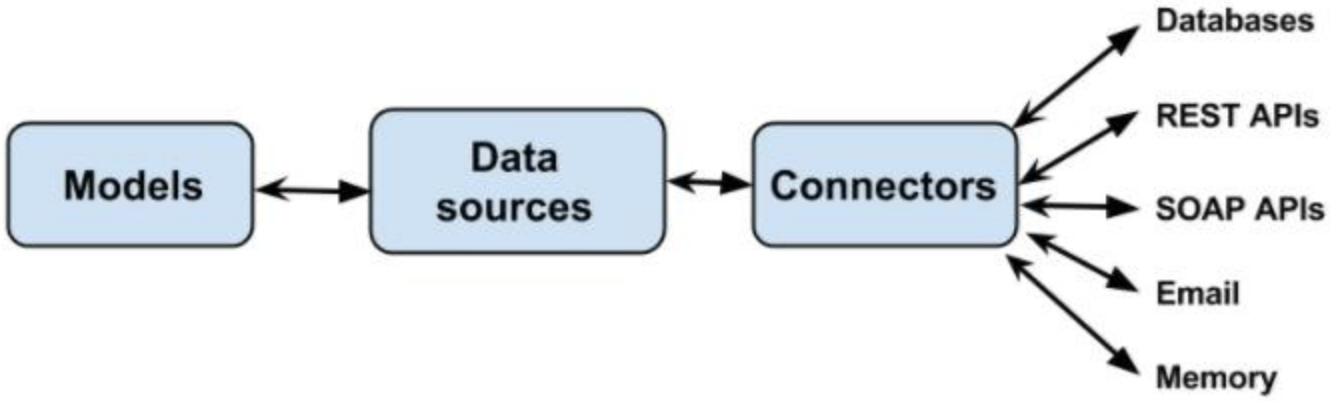
Running your application

- Now run your application
- cd bankdemo
- Node .

```
PS E:\CT\loopback\codeplay\bankdemo> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```

http://localhost:3000/explorer/#/





ONLINE BANKING WITH MYSQL AND LOOPBACK-DISCOVERY

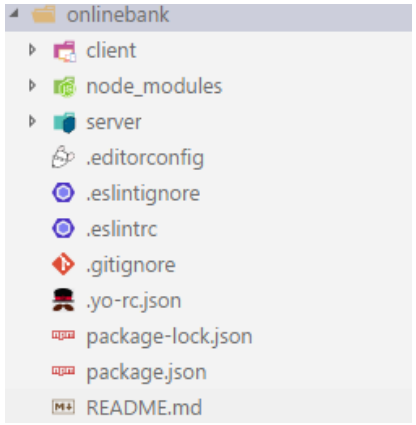
SLC LOOPBACK:DEMO-V

ONLINE BANKING DEMO

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
Next steps:

  Change directory to your app
    $ cd onlinebank

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

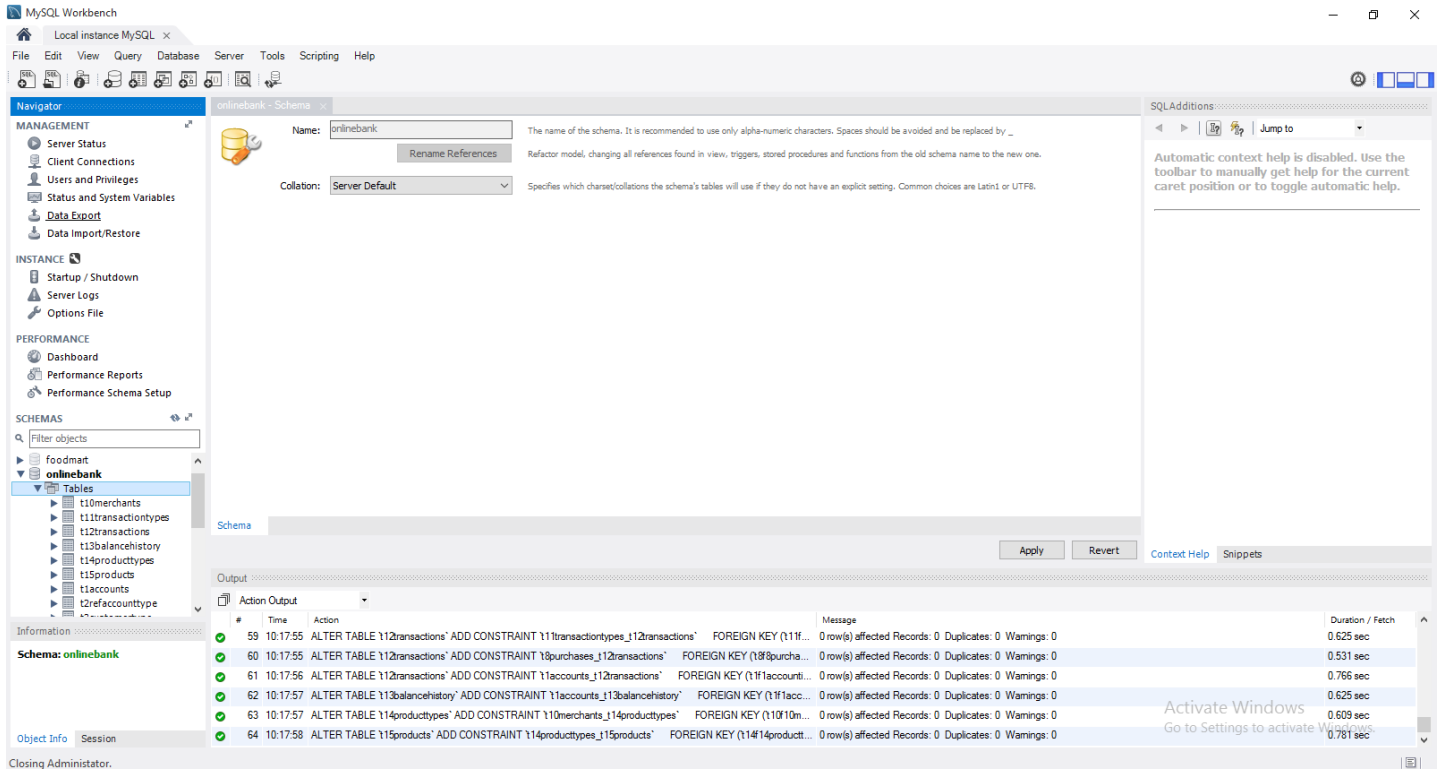
```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? onlinebank
? Enter name of the directory to contain the project: onlinebank
   create onlinebank/
     info change the working directory to onlinebank

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md
npm WARN deprecated nodemailer@2.7.2: All versions below 4.0.1 of Nodemailer are deprecated. See https://nodemailer.com/status/
[ ..................] | fetchMetadata: http fetch GET 304 https://registry.npmjs.org/arrify 232ms (from cache)
```

ONLINE BANKING DEMO

Step 2

Create MySQL database

- create a database onlinebank in MySQL5 as shown in the figure.



[Schema Script: https://github.com/awasekhirni/dbmodels/blob/master/mysql/onlinebank-mysql5-create.sql](https://github.com/awasekhirni/dbmodels/blob/master/mysql/onlinebank-mysql5-create.sql)

ONLINE BANKING DEMO

Step 3

Configure datasource

- slc loopback:datasource
- To install and configure the connector for mysql using loopback.

```
PS E:\CT\loopback\codeplay\onlinebank> slc loopback:datasource
? Enter the data-source name: onlinebank
? Select the connector for onlinebank: MySQL (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: mysql://user:pass@host/db): mysql://mysqlusr:lny786@localhost/onlinebank
ql://user:pass@host/db): mysql://mysqlusr:lny786@localhost/
onlinebank
? host: localhost
? port: 3306
? user: mysqlusr
? password: ******
? database: onlinebank
? Install loopback-connector-mysql@^2.2 Yes
```

Welcome | codeplay-notes.txt | datasources.json | T1accounts.json

```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "onlinebank": {
    "host": "localhost",
    "port": 3306,
    "url": "mysql://mysqlusr:test123@localhost/onlinebank",
    "database": "onlinebank",
    "password": "test123",
    "name": "onlinebank",
    "user": "mysqlusr",
    "connector": "mysql"
  }
}
```

ONLINE BANKING DEMO

Step 4

Install loopback-discovery

- globally install loopback-discovery npm packages.
- Post installation use loopback-discovery –a –v –d **datasourcename** to navigate and select the tables, views which would be needed to generate API

```
npm install -g loopback-discovery
```

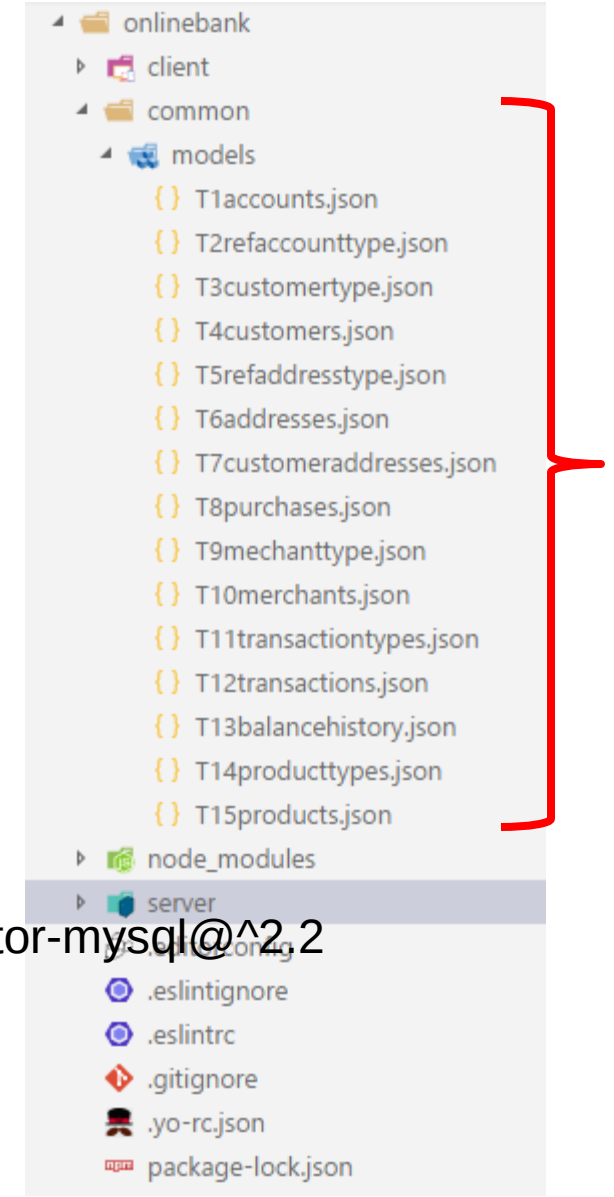
```
PS E:\CT\loopback\codeplay\onlinebank> loopback-discovery -a -v -d onlinebank
Save definition for model: T10merchants
Save definition for model: T11transactiontypes
Save definition for model: T12transactions
Save definition for model: T13balancehistory
Save definition for model: T14producttypes
Save definition for model: T15products
Save definition for model: T1accounts
Save definition for model: T2refaccounttype
Save definition for model: T3customertype
Save definition for model: T4customers
```

ONLINE BANKING DEMO

Step 5

Verify the models generated

- Now let us verify the models that have been generated using loopback-discovery as shown in the figure.



npm install –save loopback-connector-mysql@^2.2

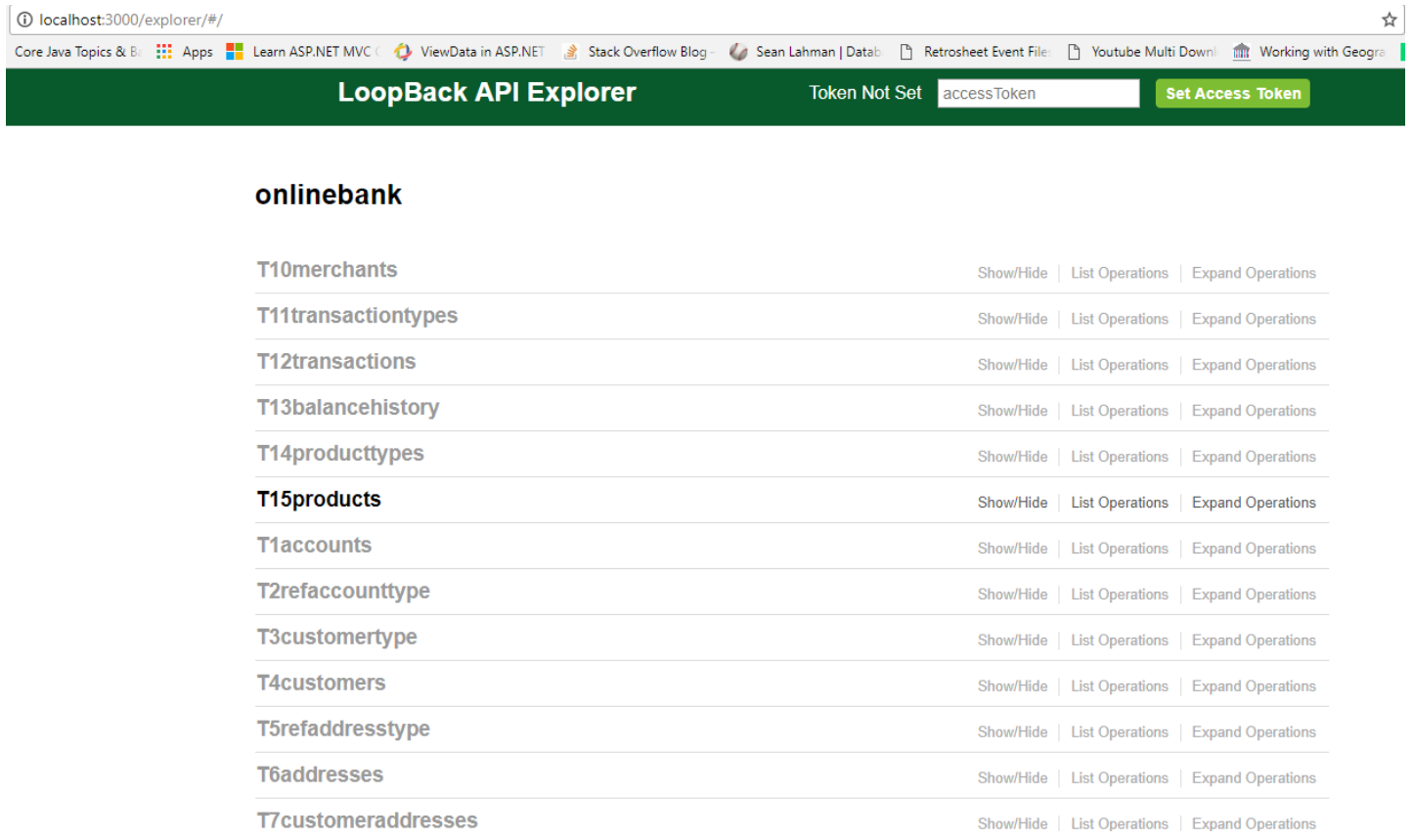
ONLINE BANKING DEMO

Step 6

Running LoopBack Application

- run your loopback application using **node .**

http://localhost:3000/explorer/#/



POINT OF SALES APPLICATION WITH POSTGRESQL

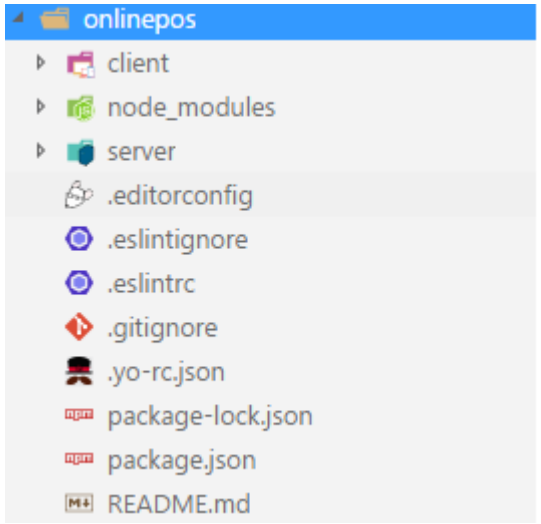
SLC LOOPBACK:DEMO-VI

ONLINE POINT OF SALE(POS)

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x



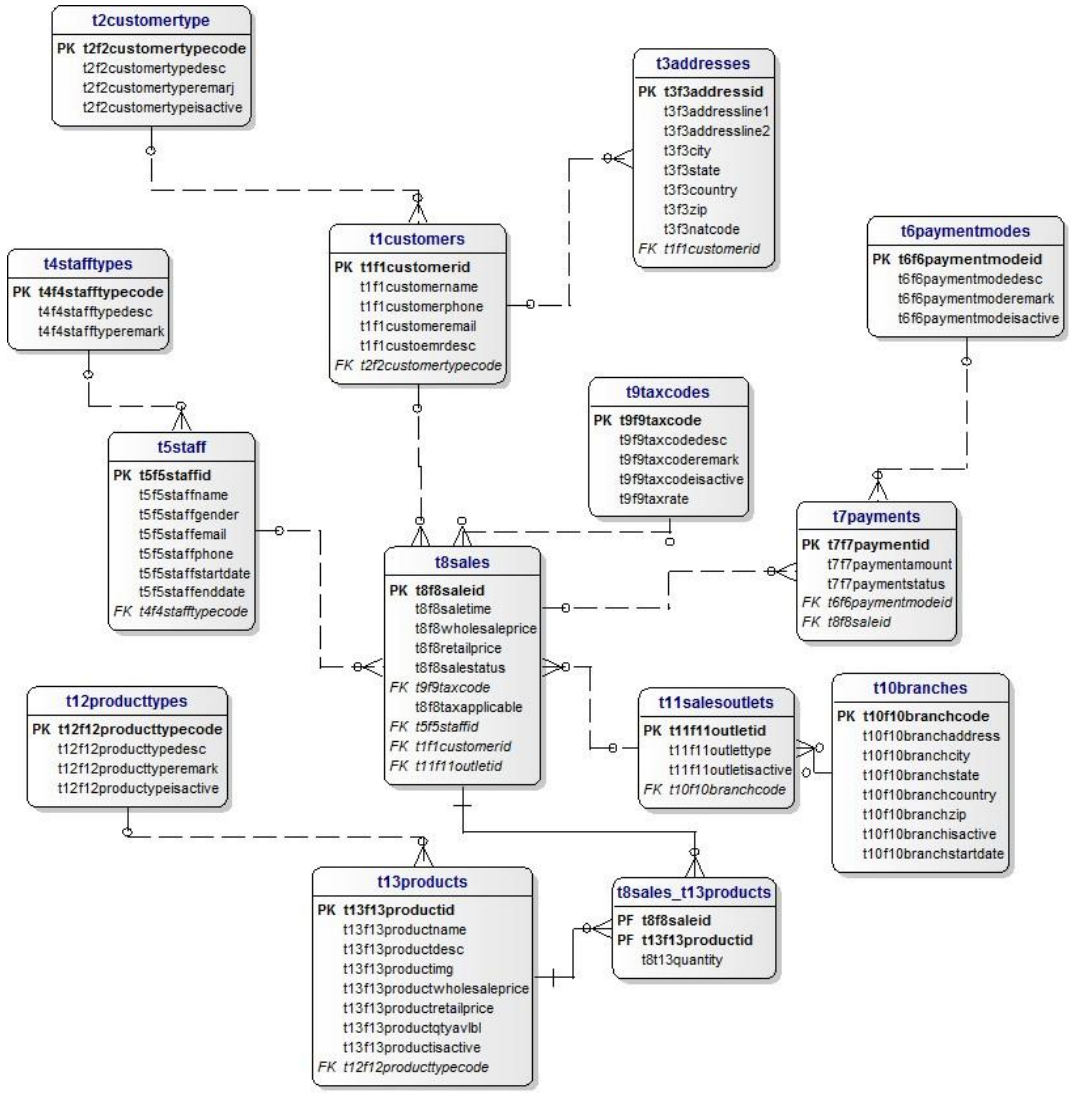

```
PS E:\CT\loopback\codeplay> slc loopback

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? onlinepos
? Enter name of the directory to contain the project: onlinepos
   create onlinepos/
     info change the working directory to onlinepos

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json


I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.


   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md
[ ..................] | fetchMetadata: sill pacote range manifest for strong-globalize@^2.6.2 fetched in 150ms

                                                        Next steps:

                                                          Change directory to your app
                                                            $ cd onlinepos

                                                          Create a model in your app
                                                            $ slc loopback:model

                                                          Run the app
                                                            $ node .
```

ONLINE POINT OF SALE(POS)

Step 2

Create PostgreSQL database

- create schema for onlinepost for postgresql

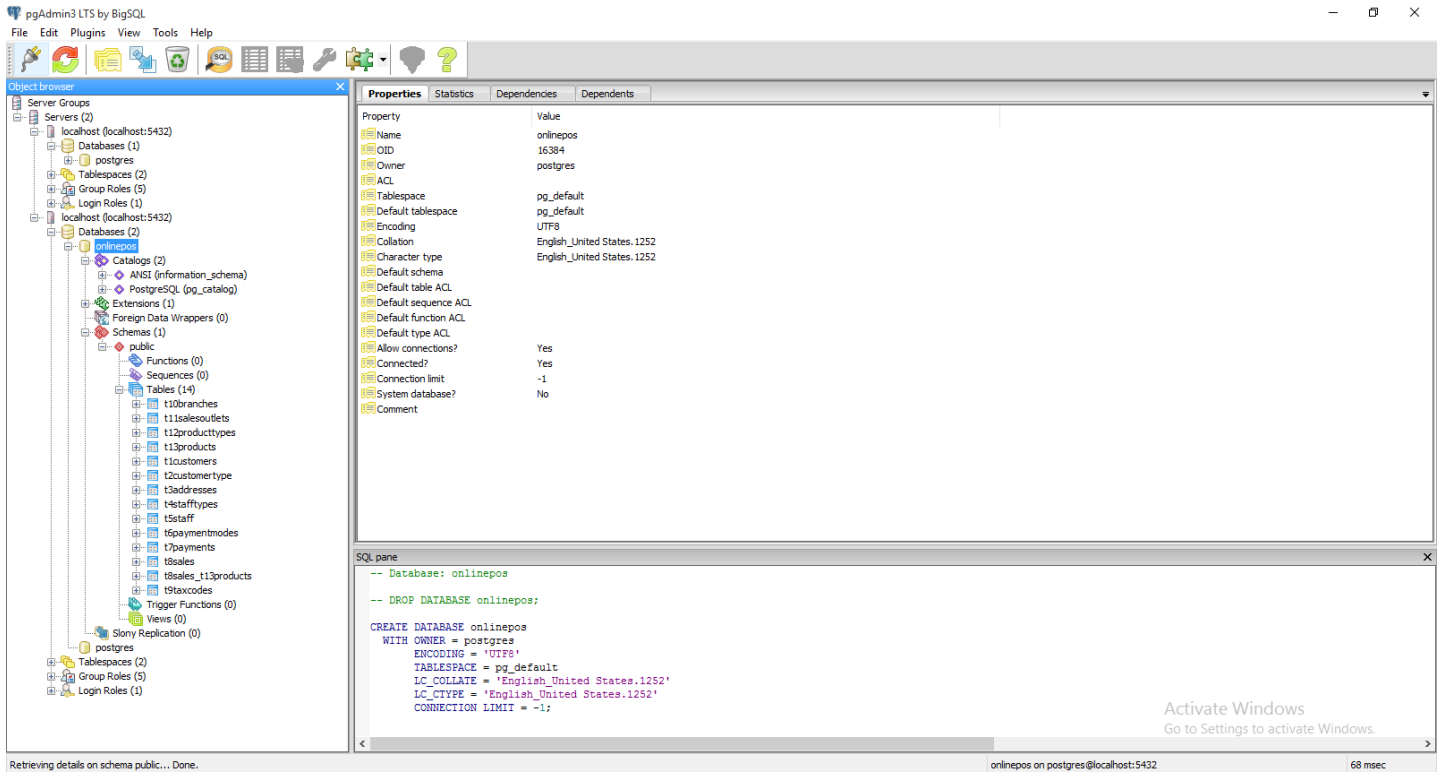


https://github.com/awasekhirni/dbmodels/blob/master/postgres/pos-postgres83.jpg

Step 3

Create PostgreSQL database

- create a database based on the erd diagram shown in the earlier step.



https://github.com/awasekhirni/dbmodels/blob/master/postgres/pos-postgres83-create.sql

ONLINE POINT OF SALE(POS)

Step 4

Configure your datasource

- configure and install the loopback connector for postgresql as shown in the figure.

```
PS E:\CT\loopback\codeplay\onlinepos> slc loopback:datasource
? Enter the data-source name: onlinepos
? Select the connector for onlinepos: PostgreSQL (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: postgres://username:password@localhost/database): postgres://postgres:@localhost/onlinepos
? host: localhost
? port: 5432
? user: postgres
? password:
? database: onlinepos
? Install loopback-connector-postgresql@^2.4 (Y/n) Y
```

datasources.json

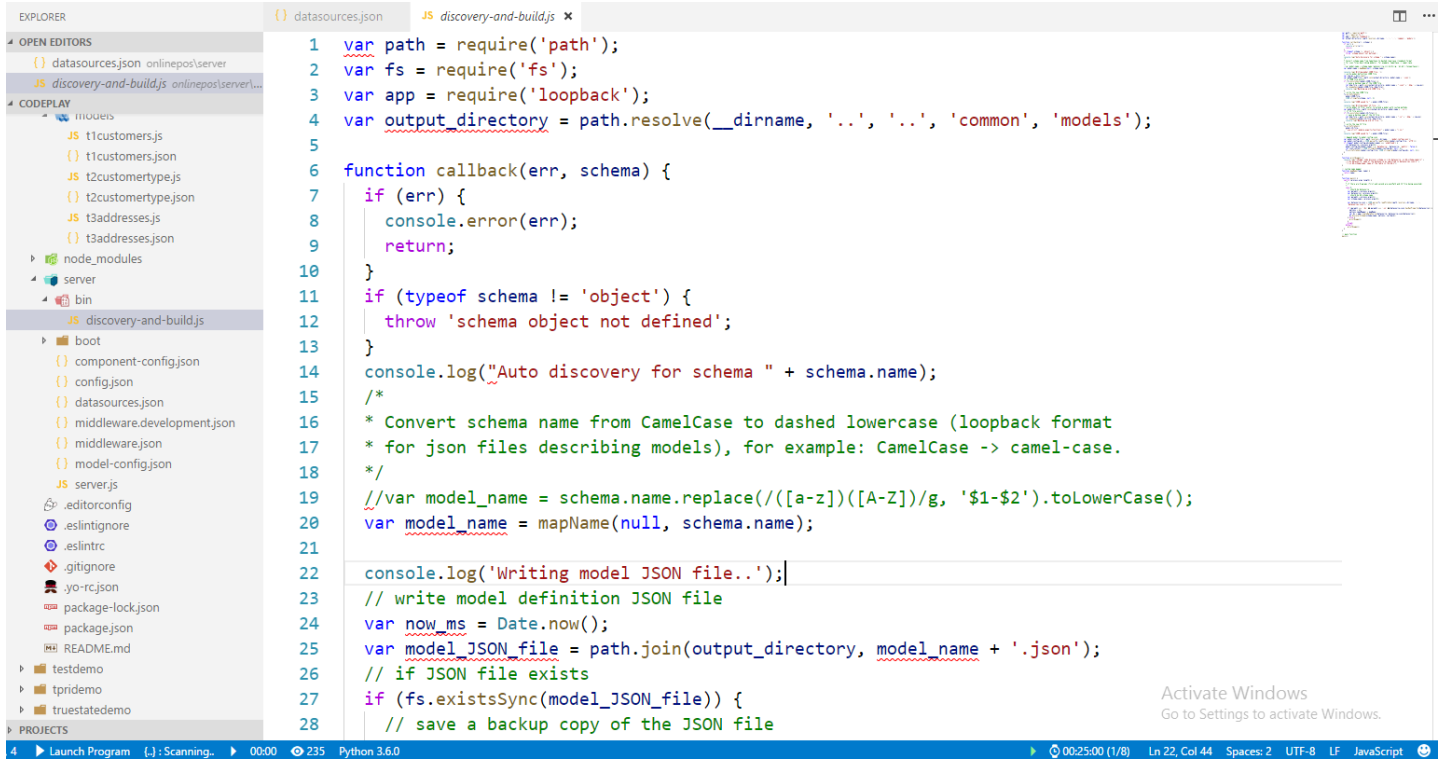
```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "onlinepos": {
    "host": "localhost",
    "port": 5432,
    "url": "postgres://postgres:@localhost/onlinepos",
    "database": "onlinepos",
    "password": "",
    "name": "onlinepos",
    "user": "postgres",
    "connector": "postgresql"
  }
}
```

ONLINE POINT OF SALE(POS)

Step 5

Write custom discover and build models

- Create directory /server/bin/
- Write the file discover-and-build.js to discover the schema from postgresql database



https://github.com/awasekhirni/dw/blob/master/loopback/discover-and-build.js

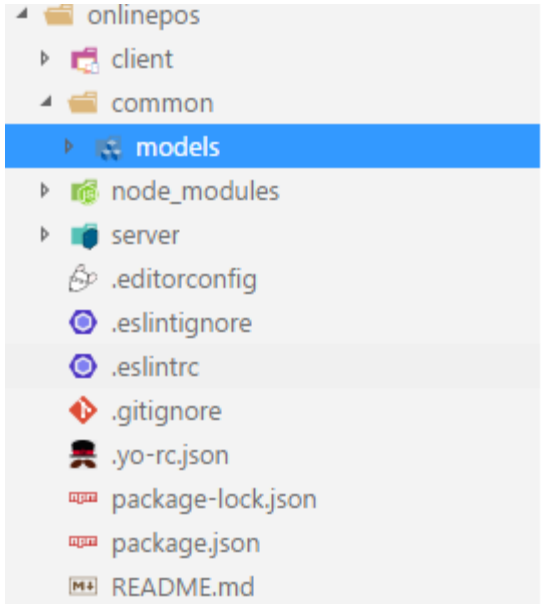
ONLINE POINT OF SALE(POS)

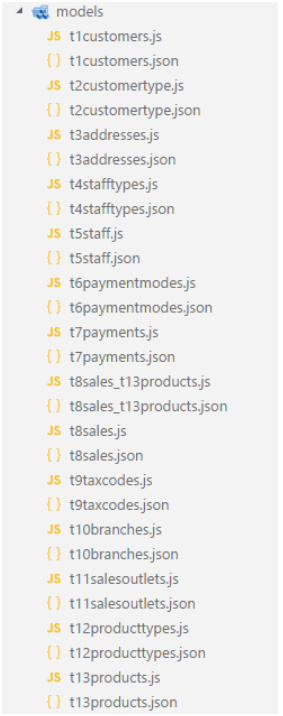
Step 6

Discover and build individual models.

-
- Run discover and build individual models to create models from the database schema => onlinepos
- Repeat the process for all tables in schema

```
PS E:\CT\loopback\codeplay\onlinepos> node .\server\bin\discovery-and-build.js -ds onlinepos -sn t1customers
Auto discovery for schema t1customers
Writing model JSON file..
JSON saved to E:\CT\loopback\codeplay\onlinepos\common\models\t1customers.json
Writing model JS file..
JSON saved to E:\CT\loopback\codeplay\onlinepos\common\models\t1customers.json
```






```
node .\server\bin\discovery-and-build.js -ds onlinepos -sn t1customers
```

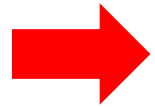
ONLINE POINT OF SALE(POS)

Step 7

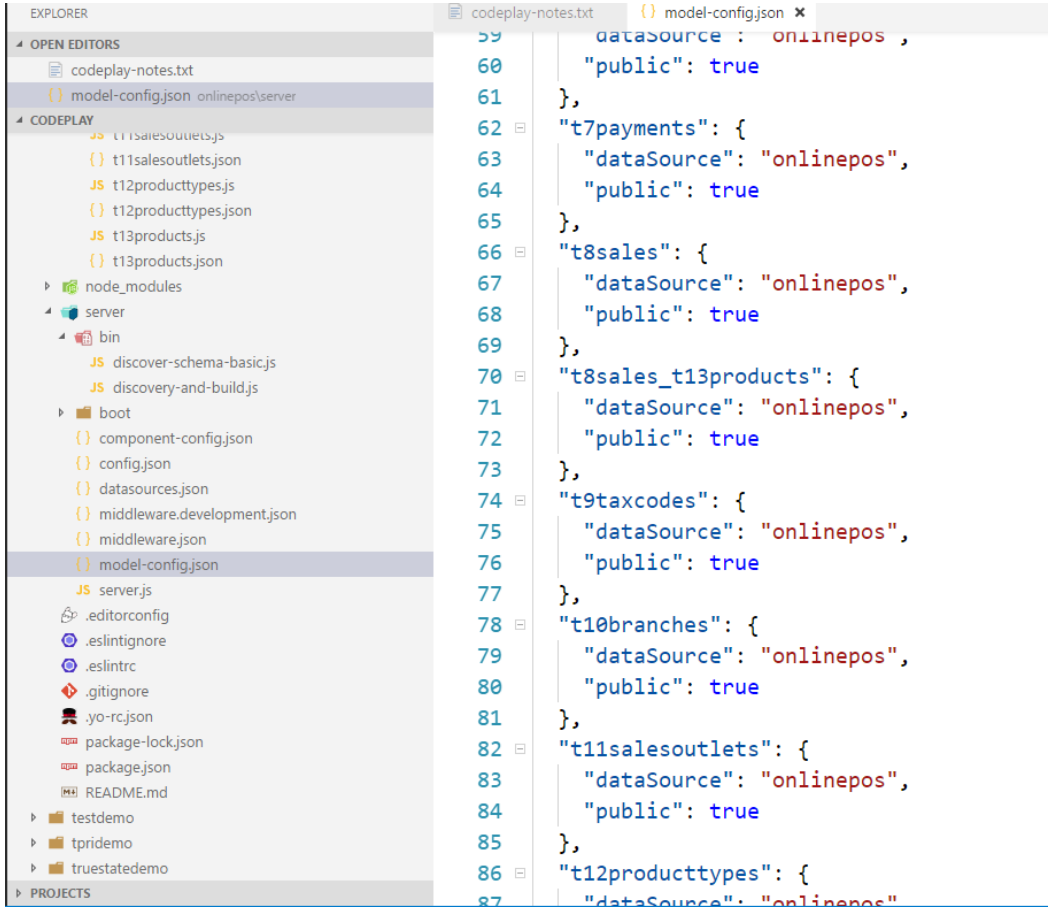
Configure model-config.json

- configure model-config.json, by toggling the models generated by **discovery-and-build** process from '**false**' to '**true**' to render in the swagger API.

```
"t13products": {
  "dataSource": "onlinepos",
  "public": false
}
```



```
"t13products": {
  "dataSource": "onlinepos",
  "public": true
}
```



ONLINE POINT OF SALE(POS)

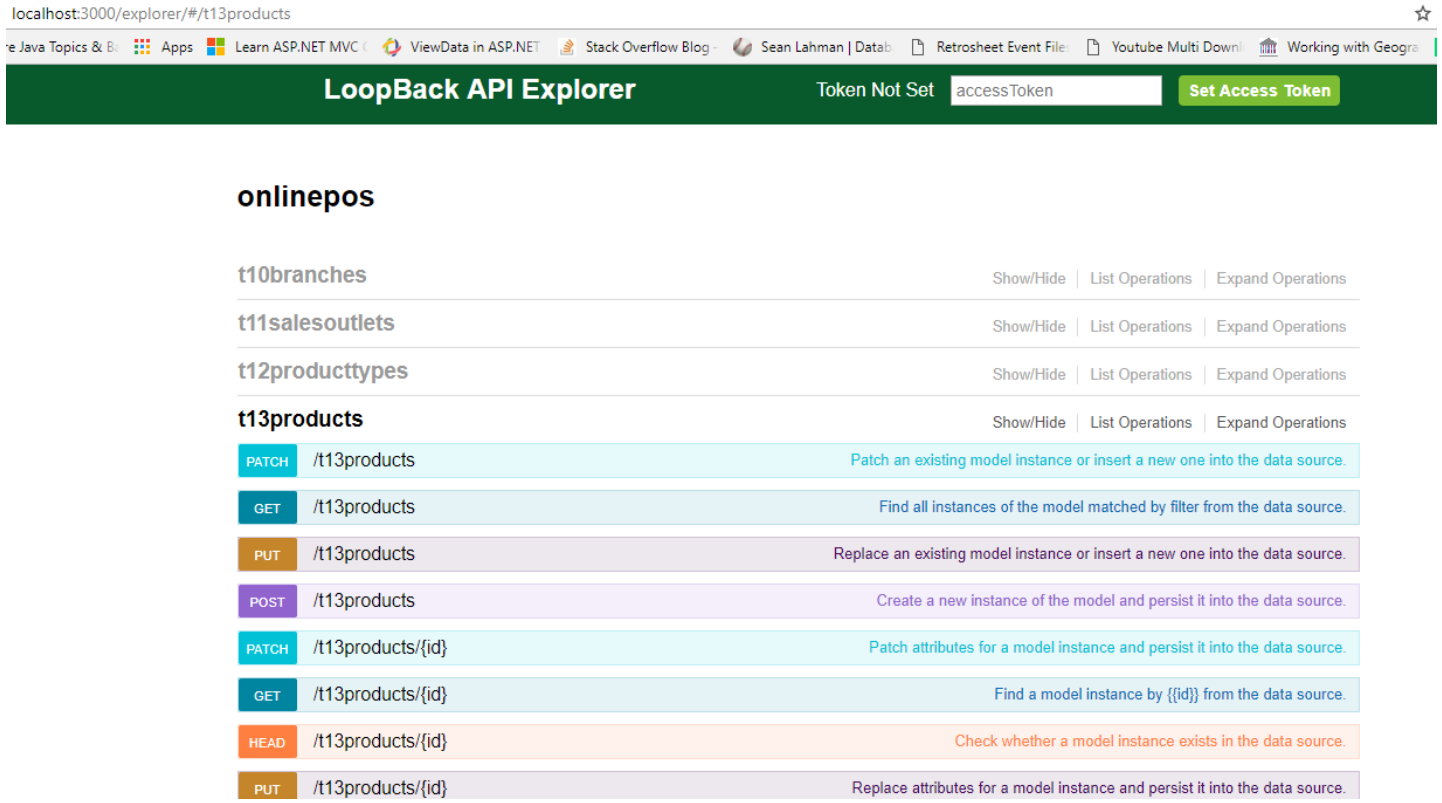
Step 7

Run your loopback application

- Run your loopback application with **node .**

```
PS E:\CT\loopback\codeplay\onlinepos> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```

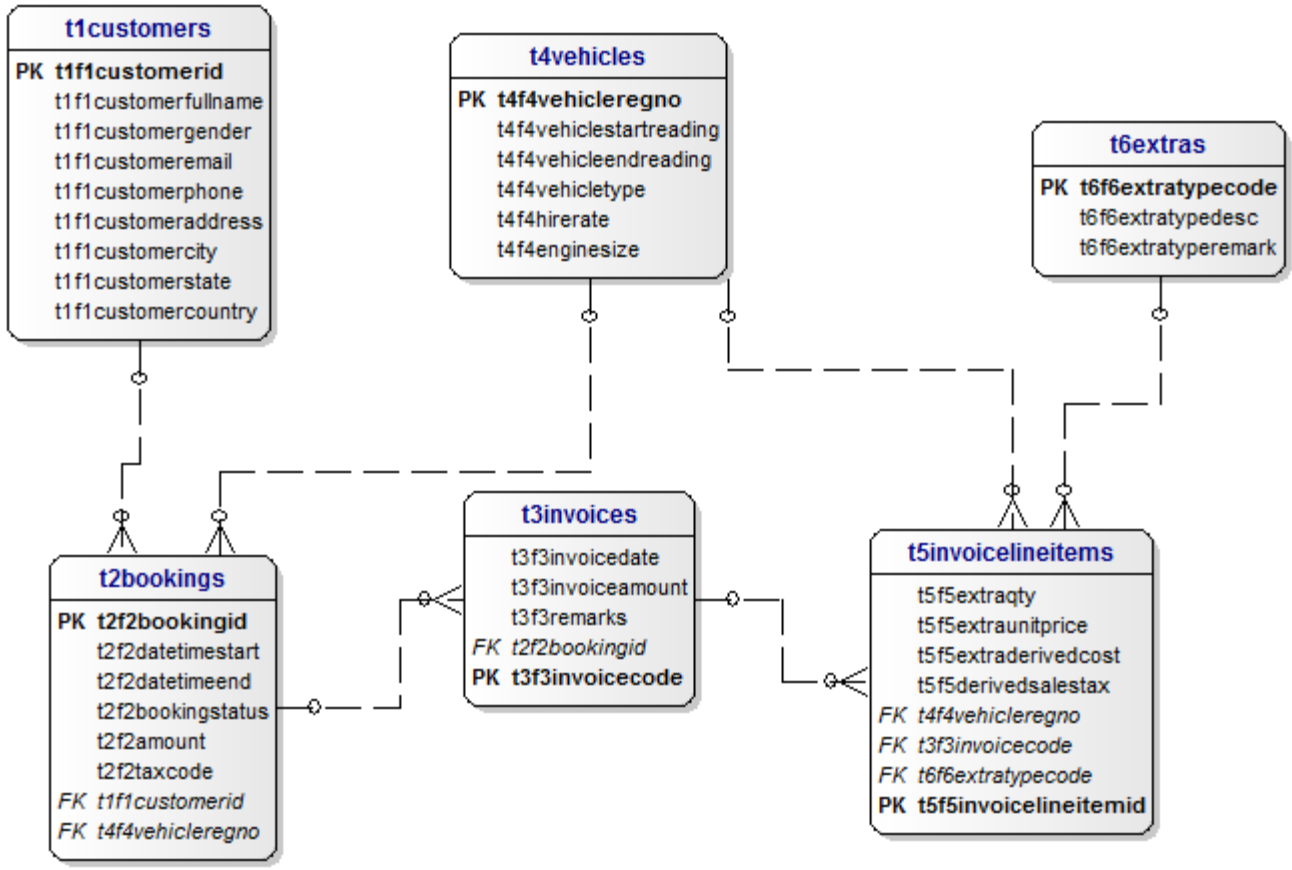
http://localhost:3000/explorer/#/



UBER CAR INVOICE WITH MONGODB

SLC LOOPBACK:DEMO-VII

UBER TRAVEL INVOICE

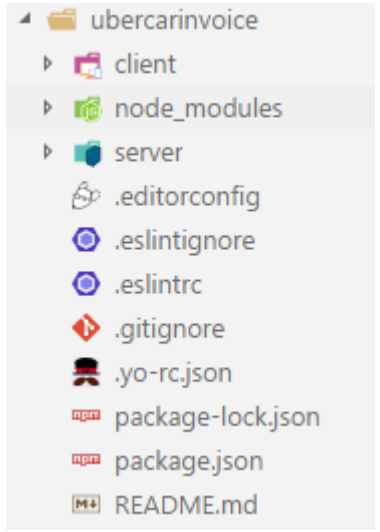


UBER CAR INVOICE(MONGODB)

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
PS E:\CT\loopback\codeplay> slc loopback ubercarinvoice

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? ubercarinvoice
? Enter name of the directory to contain the project: ubercarinvoice
   create ubercarinvoice/
     info change the working directory to ubercarinvoice

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd ubercarinvoice

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

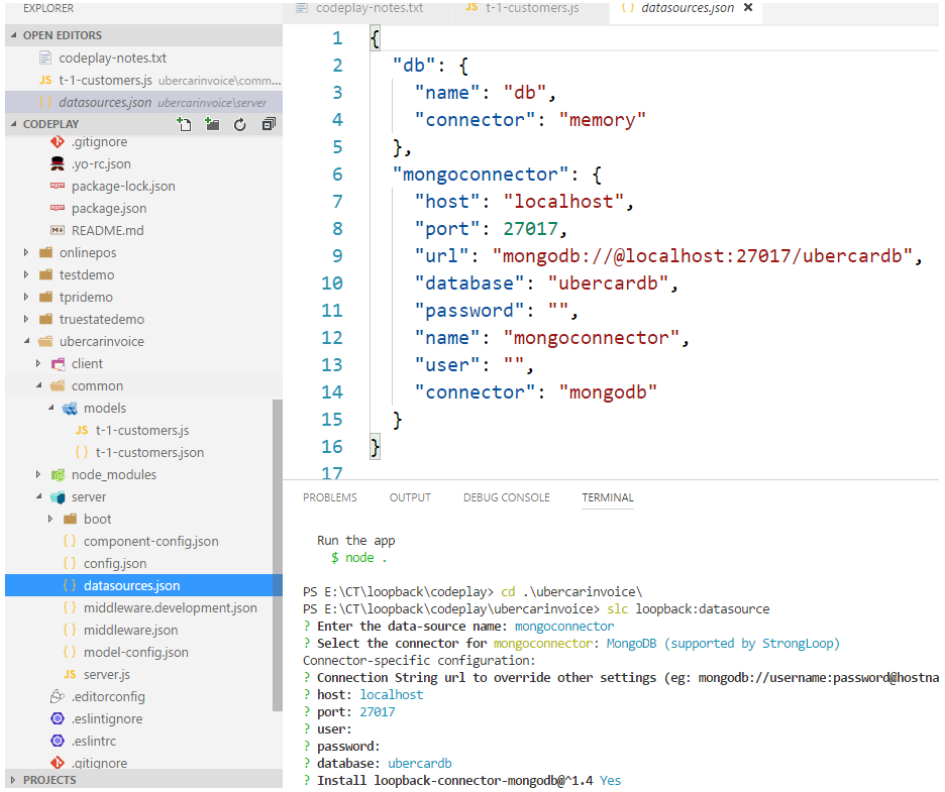
UBER CAR INVOICE(MONGODB)

Step 2

Configure datasource

- create datasource connector for mongodb as shown in the figure.

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:datasource
? Enter the data-source name: mongoconnector
? Select the connector for mongoconnector: MongoDB (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: mongodb://username:password@hostname:port/database): mongodb://@localhost:27017/ubercardb
? host: localhost
? port: 27017
? user:
? password:
? database: ubercardb
? Install loopback-connector-mongodb@^1.4 Yes
```



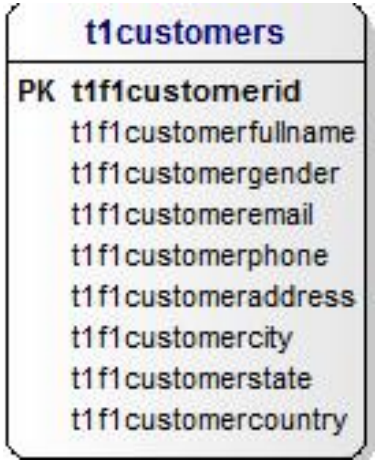
UBER CAR INVOICE(MONGODB)

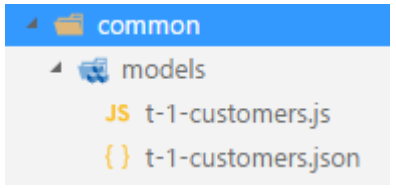
Step 3

Create models

- create models based on the erd diagram for usedcar invoice.

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:model
del
? Enter the model name: t1customers
? Select the data-source to attach t1customers to: mongoc
onnector (mongodb)
? Select model's base class PersistedModel
? Expose t1customers via the REST API? Yes
? Custom plural form (used to build REST URL): t1customers
? Common model or server only? common
Let's add some t1customers properties now.

Enter an empty property name when done.
? Property name: t1f1customerid
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:
```





codeplay-notes.txt | t-1-customers.js | t-1-customers.json

```
1  'use strict';
2  module.exports = function(T1customers) {
3  //remote methods come here
4  };
```

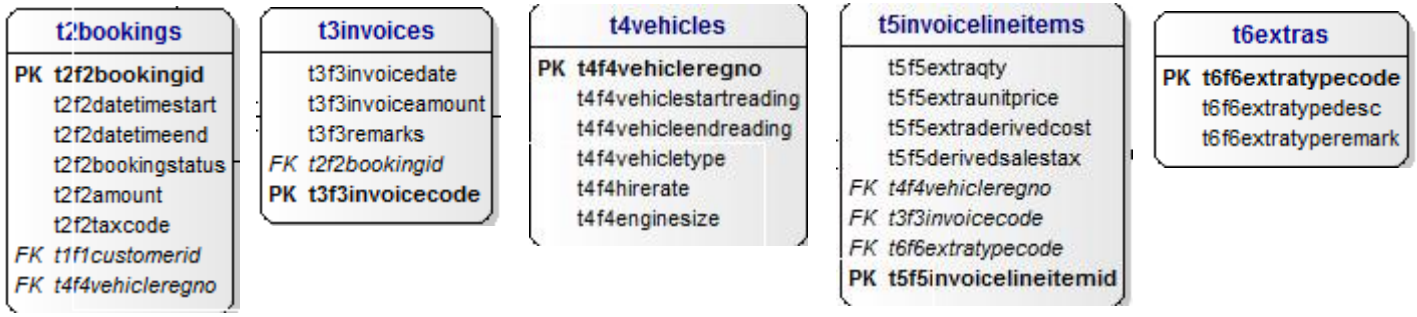
```
34      "t1f1customercity": {
35        "type": "string",
36        "required": true
37      },
38      "t1f1customerstate": {
39        "type": "string",
40        "required": true
41      },
42      "t1f1customercountry": {
43        "type": "string",
44        "required": true
45      }
46    },
47    "validations": [],
48    "relations": {},
49    "acls": [],
50    "methods": {}
51  }
52
```

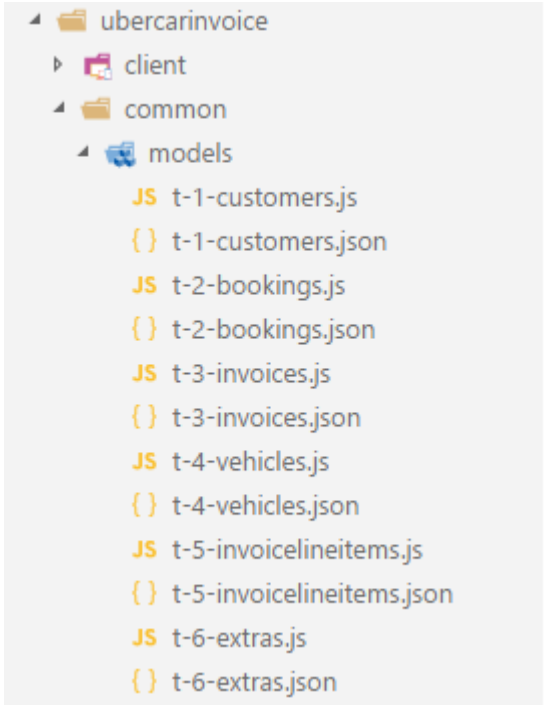
UBER CAR INVOICE(MONGODB)

Step 4

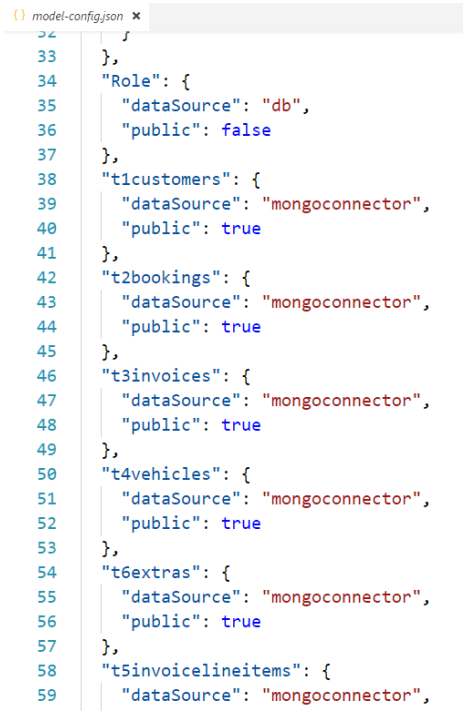
Create models

- create models using slc loopback:model





Models registered in model-config.json



UBER CAR INVOICE(MONGODB)

Step 5

Establish relationship

- create relationship between models using slc loopback: relation

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:relation
? Select the model to create the relationship from: t1customers
? Relation type: has many
? Choose a model to create a relationship with: t2bookings
? Enter the property name for the relation: t2bookings
? Optionally enter a custom foreign key:
? Require a through model? No
```

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:relation
? Select the model to create the relationship from: t4vehicles
? Relation type: has many
? Choose a model to create a relationship with: t2bookings
? Enter the property name for the relation: t2bookings
? Optionally enter a custom foreign key:
? Require a through model? No
```

t-1-customers.json

```
    "t1f1customercountry": {
      "type": "string",
      "required": true
    }
  },
  "validations": [],
  "relations": {
    "t2bookings": {
      "type": "hasMany",
      "model": "t2bookings",
      "foreignKey": ""
    }
  },
  "acls": [],
  "methods": {}
}
```

UBER CAR INVOICE(MONGODB)

Step 6

Establish relationship

- create relationship between models using slc loopback: relation

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:relation
? Select the model to create the relationship from: t2bookings
? Relation type: has many
? Choose a model to create a relationship with: t3invoices
? Enter the property name for the relation: t3invoices
? Optionally enter a custom foreign key:
? Require a through model? No
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:relation
? Select the model to create the relationship from: t3invoices
? Relation type: has many
? Choose a model to create a relationship with: t5invoicelineitems
? Enter the property name for the relation: t5invoicelineitems
? Optionally enter a custom foreign key:
? Require a through model? No
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:relation
? Select the model to create the relationship from: t4vehicles
? Relation type: has many
? Choose a model to create a relationship with: t5invoicelineitems
? Enter the property name for the relation: t5invoicelineitems
? Optionally enter a custom foreign key:
? Require a through model? No
```

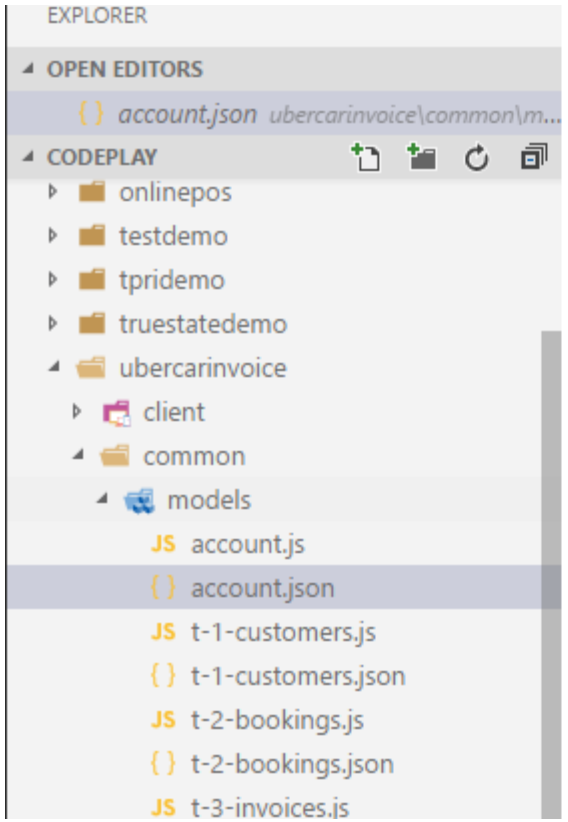
UBER CAR INVOICE(MONGODB)

Step 7

Create Account Model for User Authentication

- create account model by extending user model's base class.

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:model
? Enter the model name: Account
? Select the data-source to attach Account to: mongoconnector (mongodb)
? Select model's base class User
? Expose Account via the REST API? Yes
? Custom plural form (used to build REST URL): accounts
? Common model or server only? common
Let's add some Account properties now.

Enter an empty property name when done.
? Property name:
```



account.json

```json
{
  "name": "Account",
  "plural": "accounts",
  "base": "User",
  "idInjection": true,
  "options": {
    "validateUpsert": true
  },
  "properties": {},
  "validations": [],
  "relations": {},
  "acls": [],
  "methods": {}
}
```

UBER CAR INVOICE(MONGODB)

Step 8

ACL Enabling and Authentication

- Check boot/authentication.js
- Call slc loopback:acl generator for generators for access control list.
- Acls are added to all the existing models.

```
PS E:\CT\loopback\codeplay\ubercarinvoice> slc loopback:acl
? Select the model to apply the ACL entry to: (all existing models)
? Select the ACL scope: All methods and properties
? Select the access type: All (match all types)
? Select the role Any authenticated user
? Select the permission to apply Explicitly deny access
```

account.json

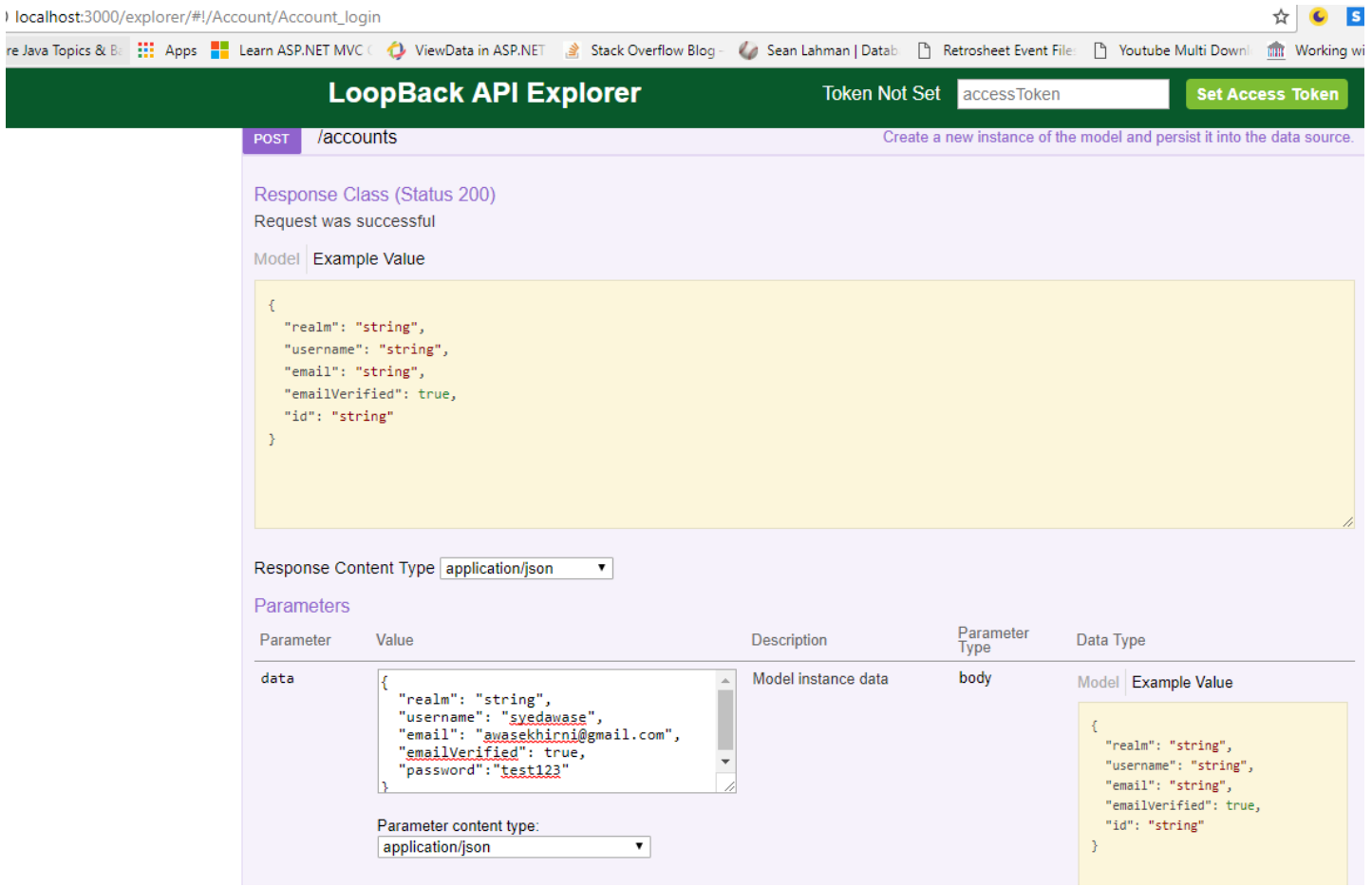
```
10    "validations": [],
11    "relations": {},
12    "acls": [
13      {
14        "accessType": "*",
15        "principalType": "ROLE",
16        "principalId": "$authenticated",
17        "permission": "DENY"
18      }
19    ],
20    "methods": {}
21  }
```

UBER CAR INVOICE(MONGODB)

Step 9

Create a new account

- access the loopback api explorer and using post method register a new account as shown in the figure.

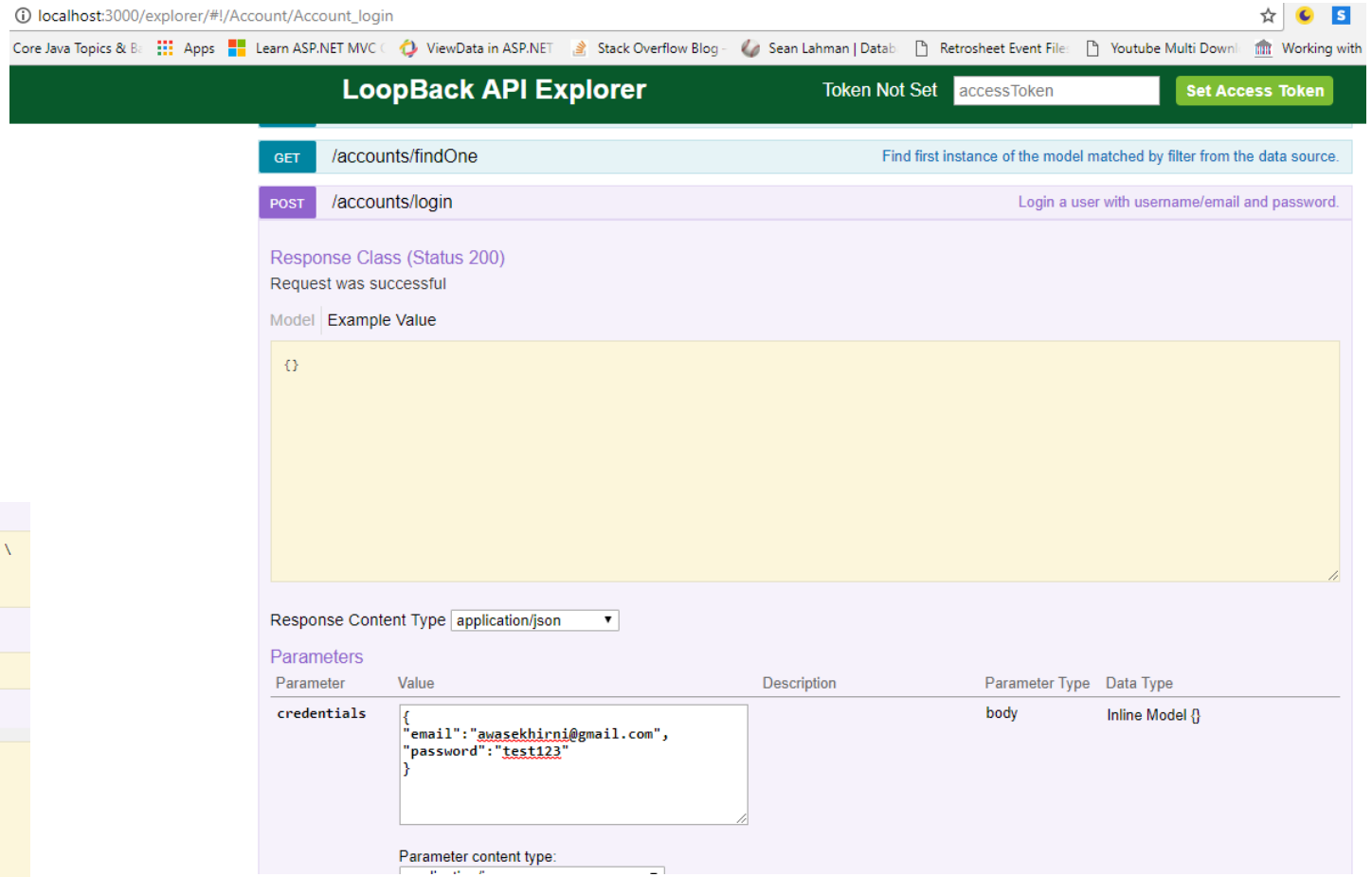


UBER CAR INVOICE(MONGODB)

Step 10

Login to loopback Explorer

- login to loopback explorer using the newly created credentials.



Curl

```
curl -X POST --header 'Content-Type: application/json' --header 'Accept: application/json' -d '{ \
 "email":"awasekhirni%40gmail.com", \
 "password":"test123" \
 }' 'http://localhost:3000/api/accounts/login'
```

Request URL

```
http://localhost:3000/api/accounts/login
```

Response Body

```
{
  "id": "Nin5MHleZm4TKlY1MCJaUDFbBbg5zOiRWHfX2BEu4qQLPDxMfGcKxbvmpgDff4dS",
  "ttl": 1209600,
  "created": "2017-12-10T10:38:36.148Z",
  "userId": "5a2d0da6ce15833b6c3a0aa7"
}
```

Response Code

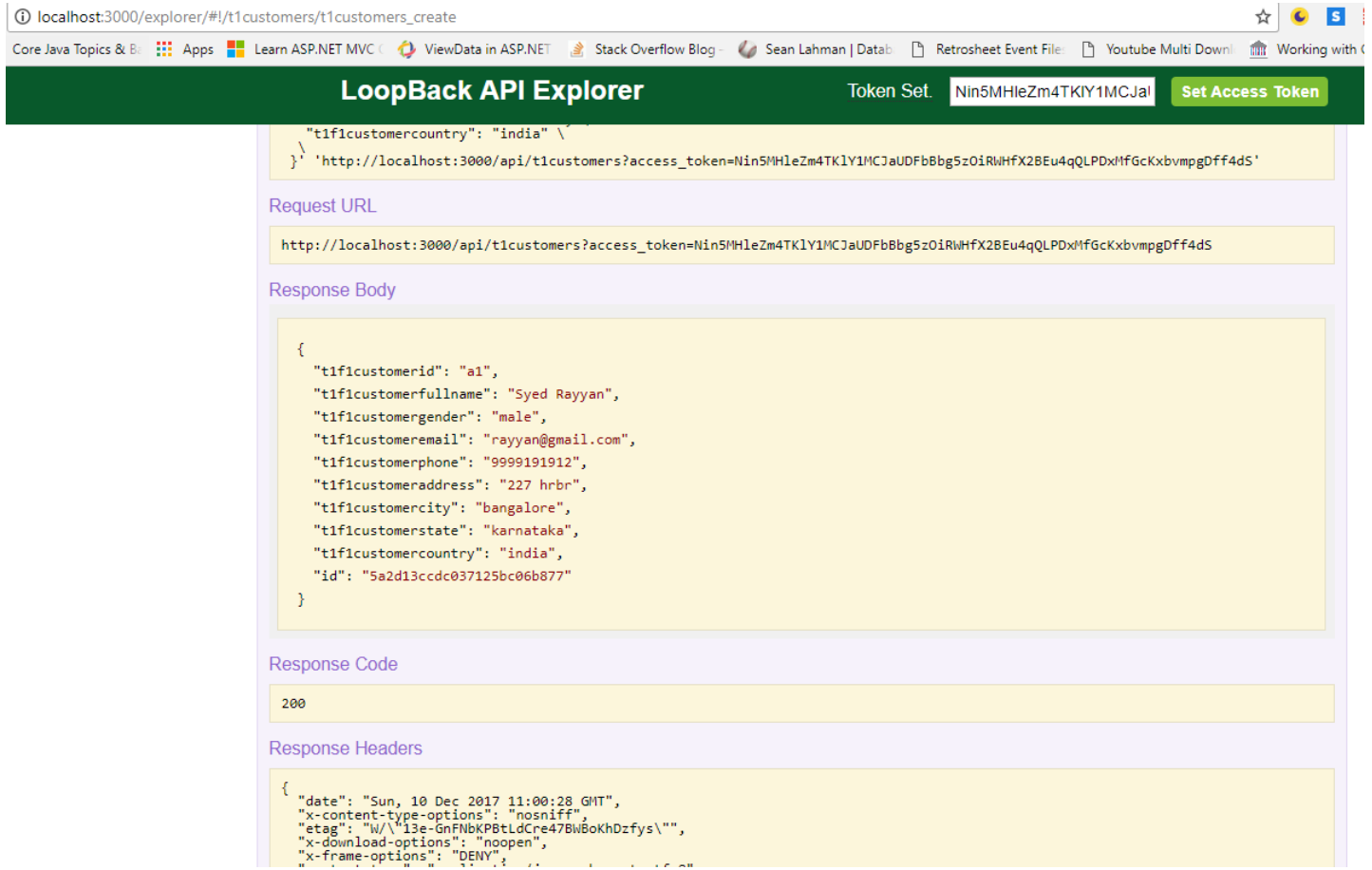
```
200
```

UBER CAR INVOICE(MONGODB)

Step 11

Applying access token

- Now apply the access token post creation of an account.
- You can now be able to create a new customer record.

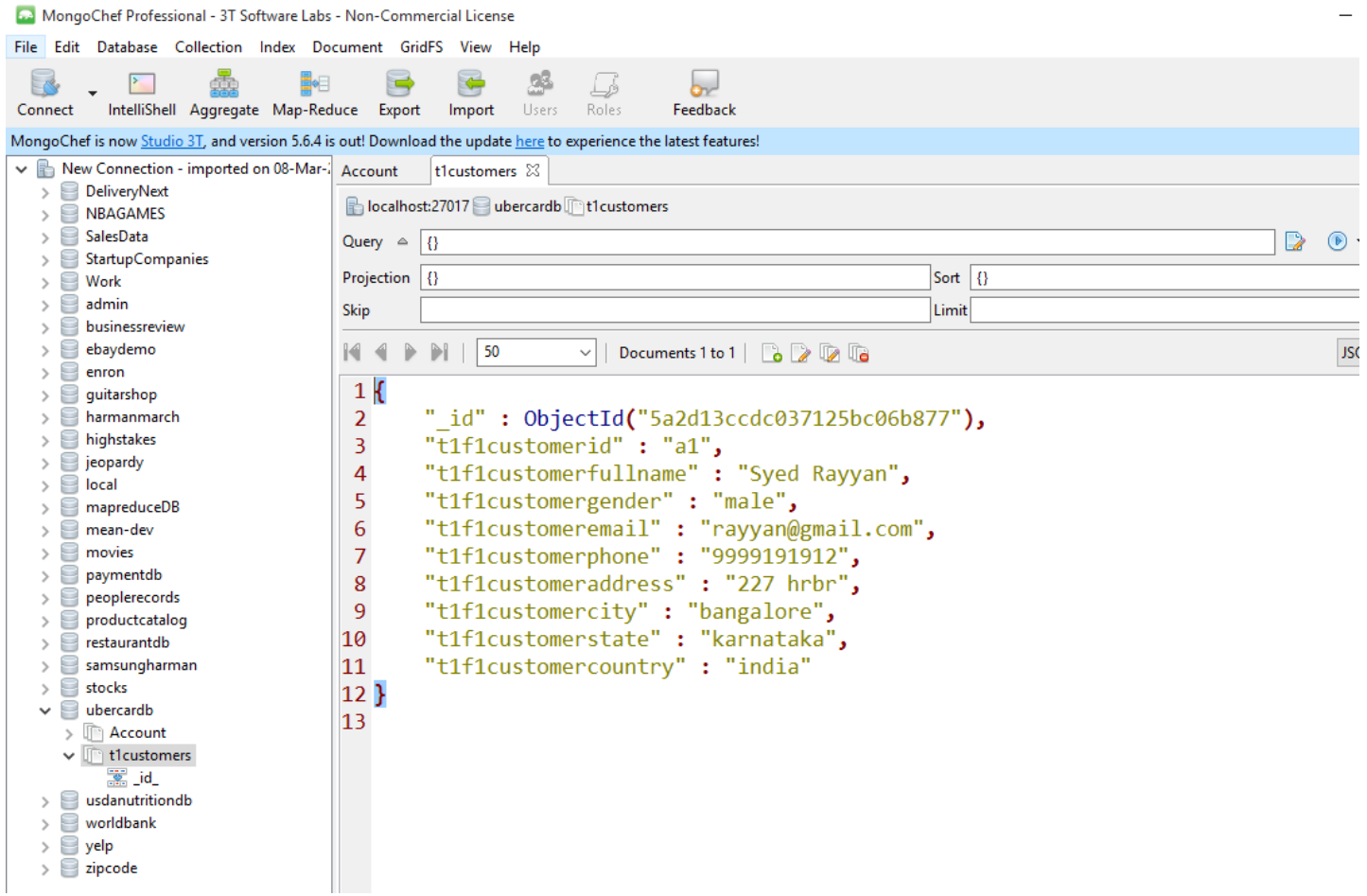


UBER CAR INVOICE(MONGODB)

Step 12

Verify records in MongoDB

- Now verifying the records are updated in mongodb



MONGODB DEMO : COMPANY MANY TO MANY RELATIONSHIP

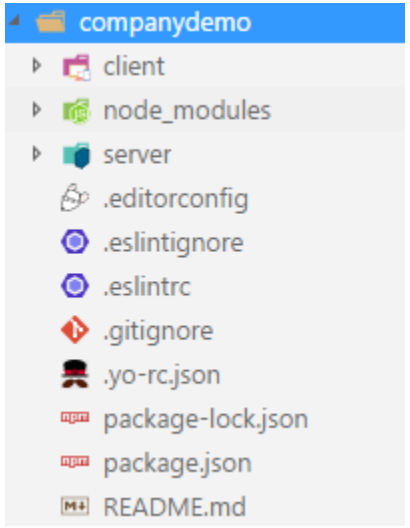
SLC LOOPBACK:DEMO-VIII

MONGODB MANY2MANY

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
PS E:\CT\loopback\codeplay> slc loopback companydemo

     _-----_
    |       |
    |--(o)--|    Let's create a LoopBack
   `---------´       application!
    ( _´U`_ )
    /___A___\   /
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y ` 

? What's the name of your application? companydemo
? Enter name of the directory to contain the project: companydemo
   create companydemo/
     info change the working directory to companydemo

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json


I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.


   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd companydemo

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

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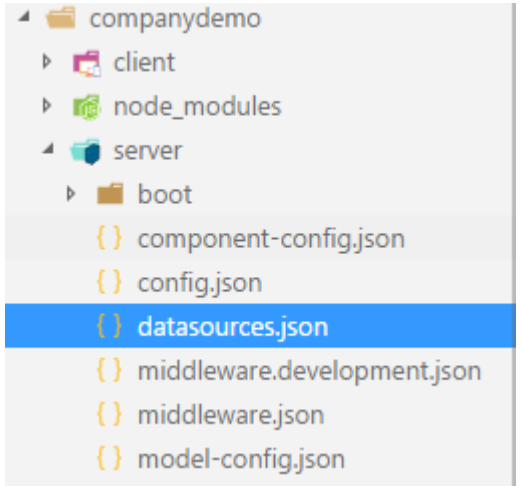
Step 2

Create a datasource

- create a datasource using slc loopback:datasource

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:datasource
? Enter the data-source name: mongoconnect
? Select the connector for mongoconnect: MongoDB (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: mongodb://username:passwor
d@hostname:port/database): mongodb://@localhost:27017/companydb
? host: localhost
? port: 27017
? user:
? password:
? database: companydb
? Install loopback-connector-mongodb@^1.4 Yes
```




```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "mongoconnect": {
    "host": "localhost",
    "port": 27017,
    "url": "mongodb://@localhost:27017/companydb",
    "database": "companydb",
    "password": "",
    "name": "mongoconnect",
    "user": "",
    "connector": "mongodb"
  }
}
```

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Step 3

Create a models

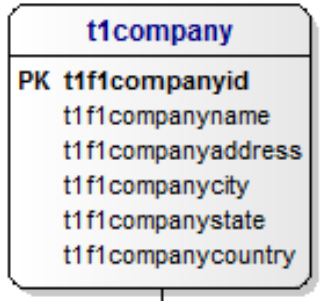
- create model for company using slc loopback:model as shown in the figure.
- It creates common/models and models inside it.

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:model
? Enter the model name: t1company
? Select the data-source to attach t1company to: mssqlconnectdb (mssql)
? Select model's base class PersistedModel
? Expose t1company via the REST API? Yes
? Custom plural form (used to build REST URL): t1companies
? Common model or server only? common
Let's add some t1company properties now.

Enter an empty property name when done.
? Property name: t1f1companyid
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another t1company property.
Enter an empty property name when done.
? Property name: t1f1companyname
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another t1company property.
Enter an empty property name when done.
? Property name: t1f1companyaddress
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:
```



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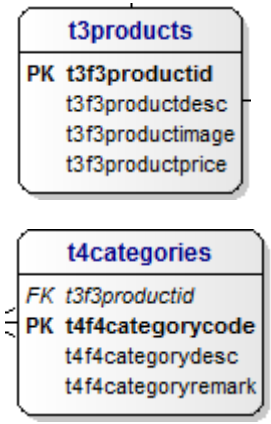
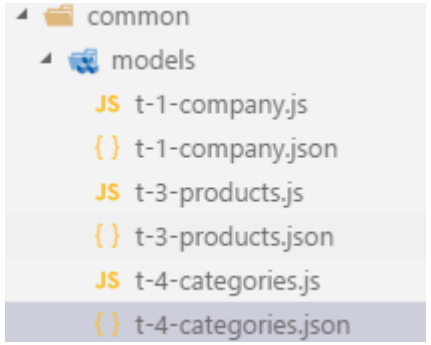


Step 4

Create a models

- create products and categories model similarly as done in step 3.




```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:model
? Enter the model name: t3products
? Select the data-source to attach t3products to: mssqlconnectdb (mssql)
? Select model's base class PersistedModel
? Expose t3products via the REST API? Yes
? Custom plural form (used to build REST URL): t3products
? Common model or server only? common
Let's add some t3products properties now.

Enter an empty property name when done.
? Property name: t3f3productid
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another t3products property.
Enter an empty property name when done.
? Property name: t3f3productname
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another t3products property.
Enter an empty property name when done.
? Property name: t3f3productdesc
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another t3products property.
Enter an empty property name when done.
? Property name: t3f3productprice
   invoke   loopback:property
? Property type: number
? Required? Yes
? Default value[leave blank for none]:
```

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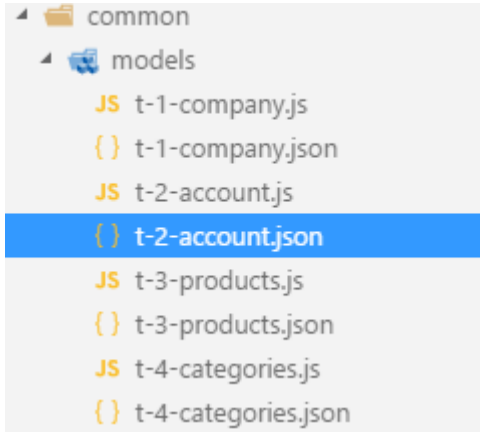
Step 5

Create a ACCOUNT MODEL

- create account model by deriving from base model “user”.




```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:model
? Enter the model name: t2account
? Select the data-source to attach t2account to: mssqlconnectdb (mssql)
? Select model's base class User
? Expose t2account via the REST API? Yes
? Custom plural form (used to build REST URL): t2accounts
? Common model or server only? common
Let's add some t2account properties now.
```

```
{
  "name": "t2account",
  "plural": "t2accounts",
  "base": "User",
  "idInjection": true,
  "options": {
    "validateUpsert": true
  },
  "properties": {},
  "validations": [],
  "relations": {},
  "acls": [],
  "methods": {}
}
```

MONGODB MANY2MANY

Step 5

Establish relationships

- establishing **one to one relationship** between company and account models.

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: t1company
? Relation type:
  has many
  belongs to
  has and belongs to many
> has one
```

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: t1company
? Relation type: has one
? Choose a model to create a relationship with: t2account
? Enter the property name for the relation: account
? Optionally enter a custom foreign key: t1f1companyid
```

```
"relations": {
  "account": {
    "type": "hasOne",
    "model": "t2account",
    "foreignKey": "t1f1companyid"
  }
},
```

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Step 7

Automigrate function

- We would like automigrate all the database tables


```
'use strict';
module.exports = function(app){
  app.dataSources.mongodb.automigrate(['t1company',
  't2account','t3products','t4categories'],err=>{
    if(err) throw err;
    console.log('All the Models are synced with
    companydb');
  })
}
```

MONGODB MANY2MANY

Step 8

Establish relationships

- establishing **one to many relationship** between categories and products.
- Each category **has many** products

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: t4categories
? Relation type: has many
? Choose a model to create a relationship with: t3products
? Enter the property name for the relation: t3products
? Optionally enter a custom foreign key: t3f3categoryid
? Require a through model? No
```

t-4-categories.json

```
"relations": {
  "t3products": {
    "type": "hasMany",
    "model": "t3products",
    "foreignKey": "t3f3categoryid"
  }
},
```

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Step 9

Establish relationships

- establishing **many to many relationship** between company and products.
- **Many companies have many products.**
- **Achieved by creating a pivot table /junction table**

SUB-STEP: A

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: t1company
? Relation type: has many
? Choose a model to create a relationship with: t3products
? Enter the property name for the relation: t3products
? Optionally enter a custom foreign key:
? Require a through model? Yes
? Choose a through model: (other)
? Enter the model name: CompanyProduct
```

PIVOT_TABLE

SUB-STEP: B

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: t3products
? Relation type: has many
? Choose a model to create a relationship with: t1company
? Enter the property name for the relation: t1companies
? Optionally enter a custom foreign key:
? Require a through model? Yes
? Choose a through model: (other)
? Enter the model name: CompanyProduct
```

PIVOT_TABLE

MONGODB MANY2MANY

Step 10

Create PIVOT TABLE MODEL

- create **pivot table “companyproduct”** with persisted model, but REST API is not enabled to render.
- CompanyProduct model **belongs to both** Product and Company model, as shown in sub-step: B.

SUB-STEP: A

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:model
? Enter the model name: CompanyProduct
? Select the data-source to attach CompanyProduct to: mongoconnect (mongodb)
? Select model's base class PersistedModel
? Expose CompanyProduct via the REST API? No
? Common model or server only? common
Let's add some CompanyProduct properties now.

Enter an empty property name when done.
? Property name:
```

SUB-STEP: B

```
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: CompanyProduct
? Relation type: belongs to
? Choose a model to create a relationship with: t3products
? Enter the property name for the relation: t3products
? Optionally enter a custom foreign key:
PS E:\CT\loopback\codeplay\companydemo> slc loopback:relation
? Select the model to create the relationship from: CompanyProduct
? Relation type: belongs to
? Choose a model to create a relationship with: t1company
? Enter the property name for the relation: t1company
? Optionally enter a custom foreign key:
```

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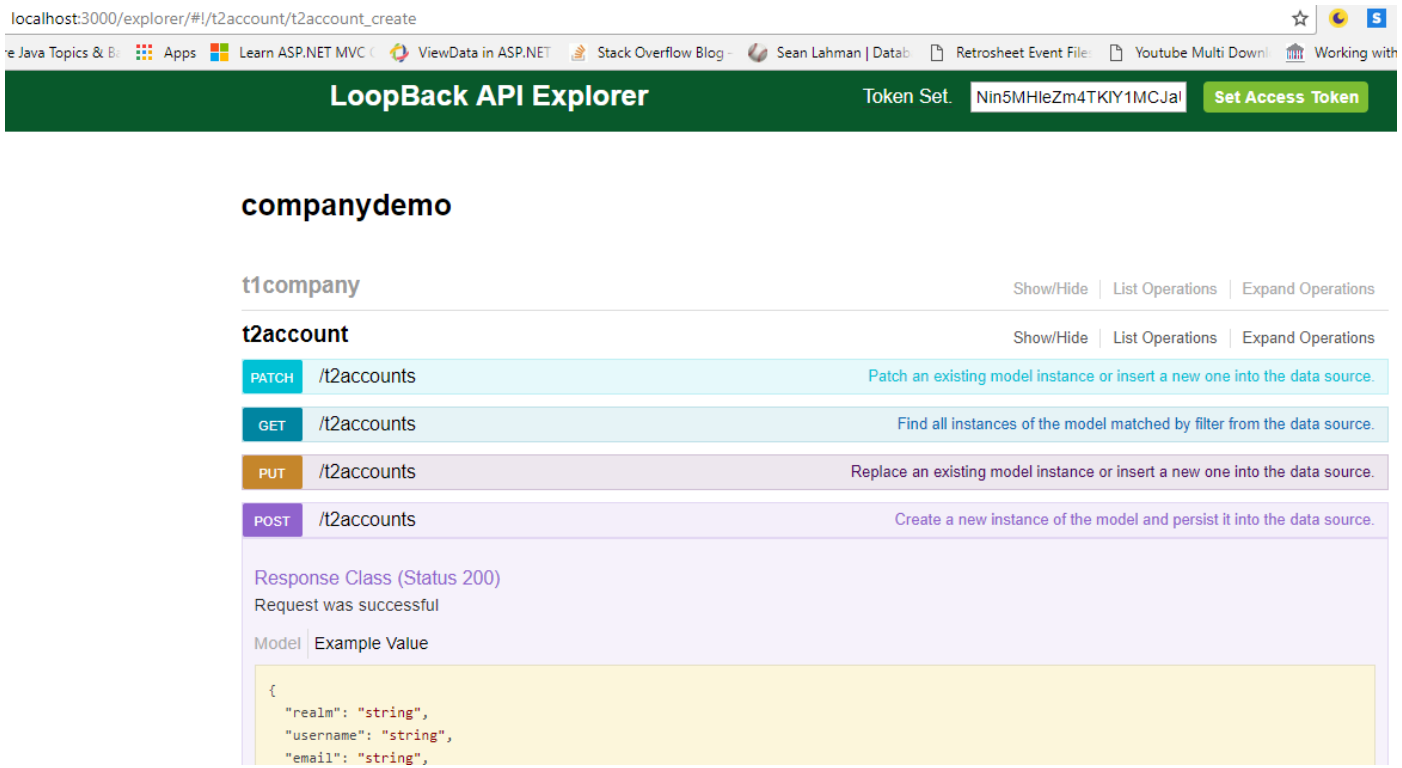
Step 11

Run your application

- run your application to render Explorer API as shown in the figure.
- Run => **node .**

```
PS E:\CT\loopback\codeplay\companydemo> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
All the Models are synced with companydb
```

http://localhost:3000/explorer/#!/t2account/t2account_create

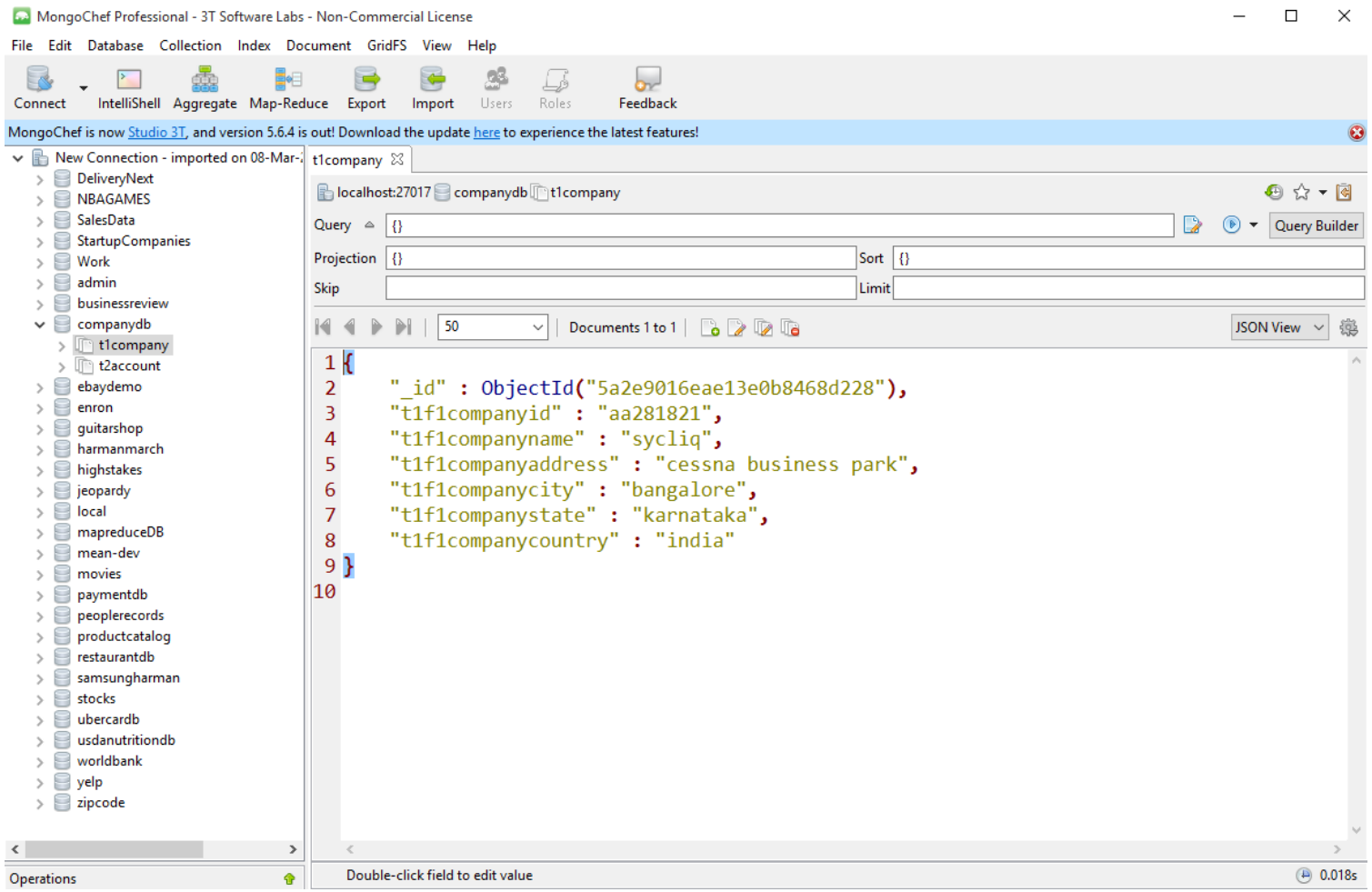


MONGODB MANY2MANY

Step 12

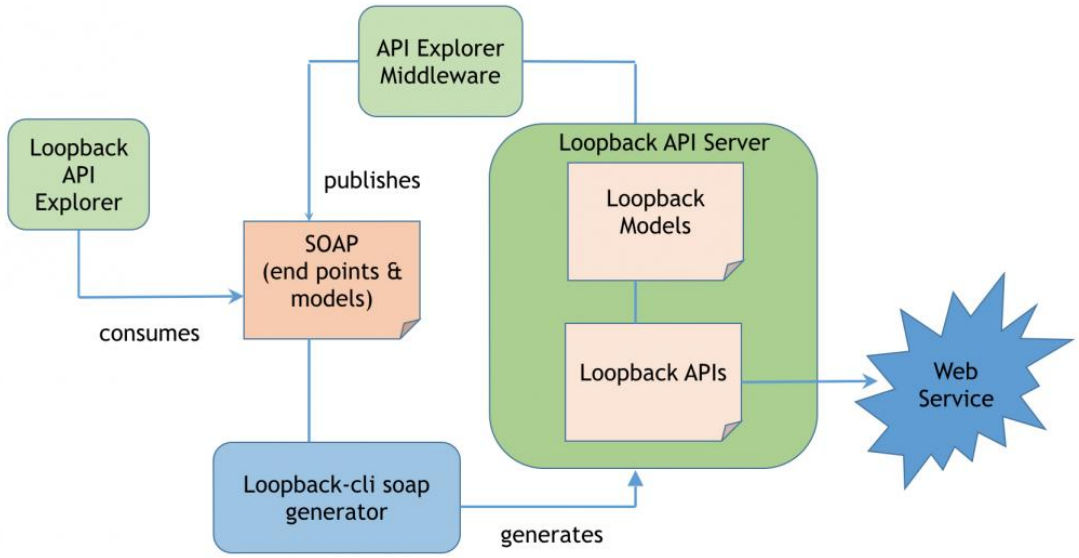
Verify data in MongoDB

- verify the data inside mongodb using mongochef.



Starting MongoDB:

```
mongod --dbpath E:\mongodata\data --port 27017 --logpath E:\mongodata\mongod.log
```



SIMPLE OBJECT ACCESS PROTOCOL (SOAP) CONNECTOR DEMO

SLC LOOPBACK:DEMO-IX

Playbook for creating soap connector

1. Bootstrap the application
   - Slc loopback weathersoap
2. Create a soap data source
   - Slc loopback:datasource
3. Create a weatherReport model
   - Slc loopback:model
4. Create loopback soap service connection and select appropriate service and bindings.
5. Run your application
   - Node .

SOAP CONNECTOR DEMO

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x

```
PS E:\CT\loopback\codeplay> slc loopback weathersoap

     _-----_
    |       |
    |--(o)--|    .--------------------------.
   `---------´   |  Let's create a LoopBack |
    ( _´U`_ )    |       application!       |
    /___A___\    '--------------------------'
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? weathersoap
? Enter name of the directory to contain the project: weathersoap
   create weathersoap/
     info change the working directory to weathersoap

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json


I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.


   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore

Next steps:

  Change directory to your app
    $ cd weathersoap

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

SOAP CONNECTOR DEMO

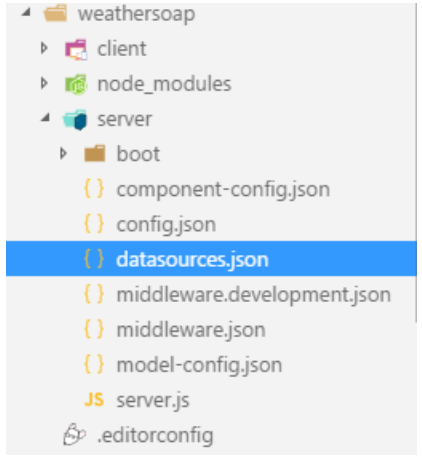
•http://www.webservicex.com/globalweather.asmx?WSDL

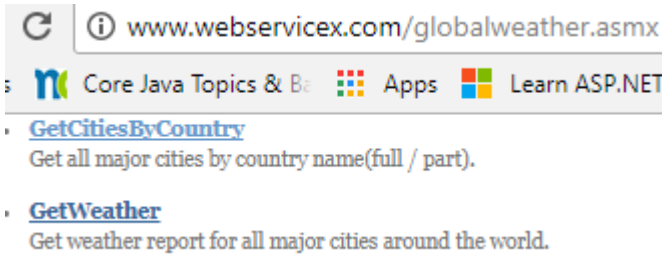
Step 2

Create a SOAP datasource

• create a soap datasource connector.

```
PS E:\CT\loopback\codeplay\weathersoap> slc loopback:datasource
? Enter the data-source name: soapconnect
? Select the connector for soapconnect: SOAP webservices (supported by StrongLoop)
Connector-specific configuration:
? URL to the SOAP web service endpoint: http://www.webservicex.com/globalweather.asmx
? HTTP URL or local file system path to the WSDL file: http://www.webservicex.com/globalweather.asmx?WSDL
? Expose operations as REST APIs: Yes
? Maps WSDL binding operations to Node.js methods:
? Install loopback-connector-soap@^3.0 Yes
[      ............] | diffTrees: sill install generateActionsToTake
```






```
"operations":{
  "GetCitiesByCountry": {
    "service": "GlobalWeather",
    "port": "GlobalWeatherSoap",
    "operation": "GetCitiesByCountry"
  },
  "GetWeather": {
    "service": "GlobalWeather",
    "port": "GlobalWeatherSoap",
    "operation": "GetWeather"
  }
```

Other examples of WSDL files:

•http://webservices.amazon.com/AWSECommerceService/AWSECommerceService.wsdl
•http://webservices.amazon.com/AWSECommerceService/2013-08-01/AWSECommerceService.wsdl
•http://webservices.gama-system.com/stockquotes.asmx?wsdl
• http://www.webservicex.net/periodictable.asmx?WSDL
•http://www.webservicex.com/globalweather.asmx?WSDL

Step 2

- Created data source with operations

```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "soapconnect": {
    "url": "http://www.webservicex.com/globalweather.asmx",
    "name": "soapconnect",
    "wsdl": "http://www.webservicex.com/globalweather.asmx?WSDL",
    "remotingEnabled": true,
    "operations":{
      "GetCitiesByCountry": {
        "service": "GlobalWeather",
        "port": "GlobalWeatherSoap",
        "operation": "GetCitiesByCountry"
      },
      "GetWeather": {
        "service": "GlobalWeather",
        "port": "GlobalWeatherSoap",
        "operation": "GetWeather"
      }
    },
    "connector": "soap"
  }
}
```

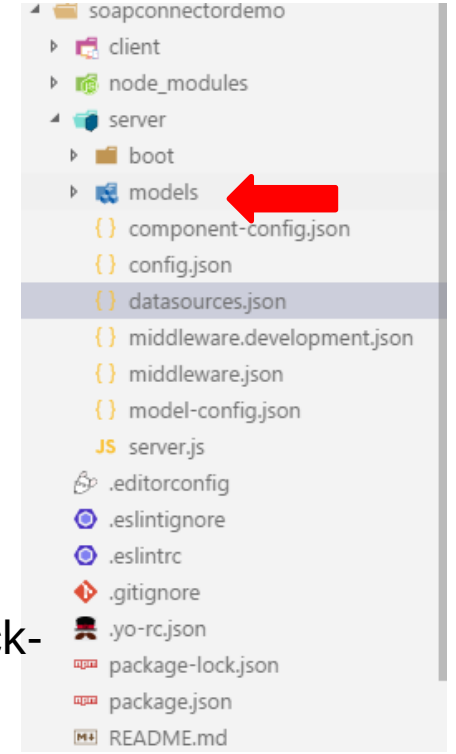
SOAP CONNECTOR DEMO

Step 3

Create a cart model

- create cart model using slc loopback:model
- The model is render in the **server only and it extends model base class.**
- **Notice that server/models directory is created with cartmodel**

```
PS E:\CT\loopback\codeplay\soapconnectordemo> slc loopback:model
? Enter the model name: cartmodel
? Select the data-source to attach cartmodel to: soapconnector (soap)
? Select model's base class Model
? Expose cartmodel via the REST API? Yes
? Custom plural form (used to build REST URL): no
? Common model or server only? server
Let's add some cartmodel properties now.

Enter an empty property name when done.
? Property name:
```



https://github.com/strongloop-community/loopback-example-connector/tree/soap#scaffold-the-app

SOAP CONNECTOR DEMO

Step 3

Create models

- Create a model for weathermodel using slc loopback:model

```
PS E:\CT\loopback\codeplay\weathersoap> slc loopback:model
? Enter the model name: weathermodel
? Select the data-source to attach weathermodel to: soapconnect (soap)
? Select model's base class Model
? Expose weathermodel via the REST API? Yes
? Custom plural form (used to build REST URL): NO
? Common model or server only? server
Let's add some weathermodel properties now.

Enter an empty property name when done.
? Property name:
```

SOAP CONNECTOR DEMO

Step 4

Generate APIs from SOAP web services datasource

- lb soap => select the **soapconnect datasource**
- Identify the service
- Identify the binding.
- Select operations to be generated.

```
PS E:\CT\loopback\codeplay\weathersoap> lb soap
? Select the datasource for SOAP discovery soapconnect
WSDL for datasource soapconnect: http://www.webservicex.com/globalweather.asmx?WSDL
? Select the service: GlobalWeather
? Select the binding: GlobalWeatherSoap
? Select operations to be generated: (Press <space> to select, <a> to toggle all, <i> to inverse selection)GetWeather, GetCitiesByCountry
Creating model definition for soap_GlobalWeatherSoap...
Creating model definition for GetWeather...
Creating model definition for GetWeatherResponse...
Creating model definition for GetCitiesByCountry...
Creating model definition for GetCitiesByCountryResponse...
Model definition created/updated for soap_GlobalWeatherSoap.
Model definition created/updated for GetWeatherResponse.
Model definition created/updated for GetCitiesByCountryResponse.
Model definition created/updated for GetCitiesByCountry.
Model definition created/updated for GetWeather.
Creating model config for soap_GlobalWeatherSoap...
Model config created for soap_GlobalWeatherSoap.
Creating model config for GetWeather...
Model config created for GetWeather.
Creating model config for GetWeatherResponse...
Model config created for GetWeatherResponse.
Creating model config for GetCitiesByCountry...
Model config created for GetCitiesByCountry.
Creating model config for GetCitiesByCountryResponse...
Model config created for GetCitiesByCountryResponse.
Generating E:\CT\loopback\codeplay\weathersoap\server\models\soap-global-weather-soap.js
Models are successfully generated from WSDL
```

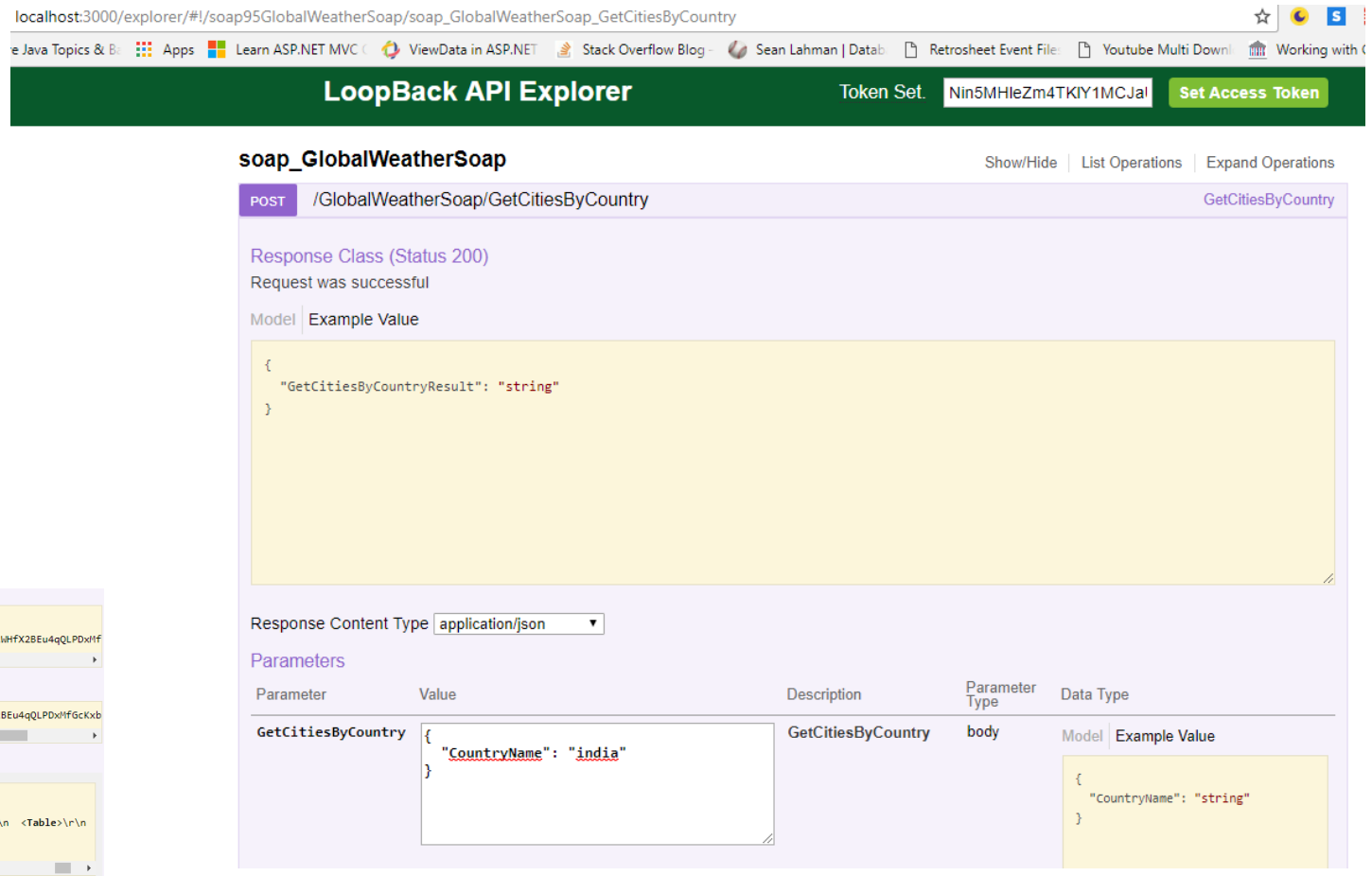
SOAP CONNECTOR DEMO

Step 5

Run your application

- Let us run our API explorer => **node .**

```
PS E:\CT\loopback\codeplay\weathersoap> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```



SOAP CONNECTOR DEMO WITH REMOTE METHODS

SLC LOOPBACK:DEMO-X

Playbook for creating soap connect with remote methods

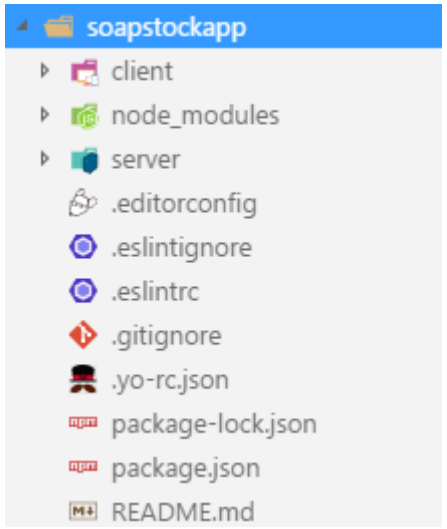
1. Bootstrap the application
   - Slc loopback soapstockapp
2. Create a soap data source
   - Slc loopback:datasource
3. Create a soapstock model
   - Slc loopback:model
4. Add static remote methods to server models
   - Add custom logic to javascript (model)
5. Run your application
   - Node .

SOAPSTOCK +REMOTE METHODS

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x



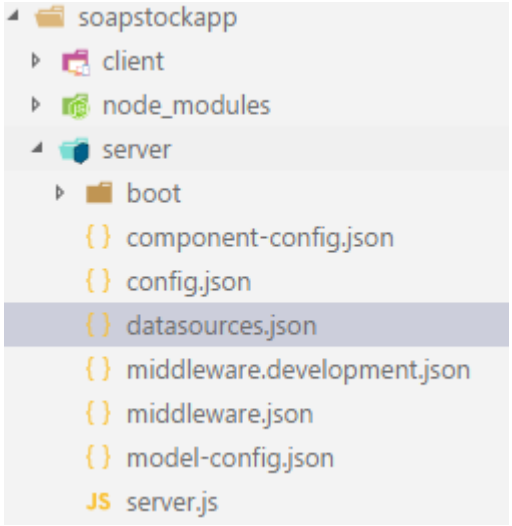

```
PS E:\CT\loopback\codeplay> slc loopback soapstockapp

     _-----_
    |       |
    |--(o)--|    .--------------------------.
   `---------´   |  Let's create a LoopBack  |
    ( _´U`_ )    |       application!       |
    /___A___\    '--------------------------'
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y ` 

? What's the name of your application? soapstockapp
? Enter name of the directory to contain the project: soapstockapp
   create soapstockapp/
     info change the working directory to soapstockapp

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd soapstockapp

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

SOAPSTOCK +REMOTE METHODS

Step 2

Create a SOAP datasource

- create a soap datasource connector.




```
PS E:\CT\loopback\codeplay\soapstockapp> slc loopback:datasource
? Enter the data-source name: soaprmconnect
? Select the connector for soaprmconnect: SOAP webservices (supported by StrongLoop)
Connector-specific configuration:
? URL to the SOAP web service endpoint: http://www.webservicex.net/stockquote.asmx
? HTTP URL or local file system path to the WSDL file: http://www.webservicex.net/stockquote.asmx?WSDL
? Expose operations as REST APIs: Yes
? Maps WSDL binding operations to Node.js methods:
? Install loopback-connector-soap@^3.0 Yes
```

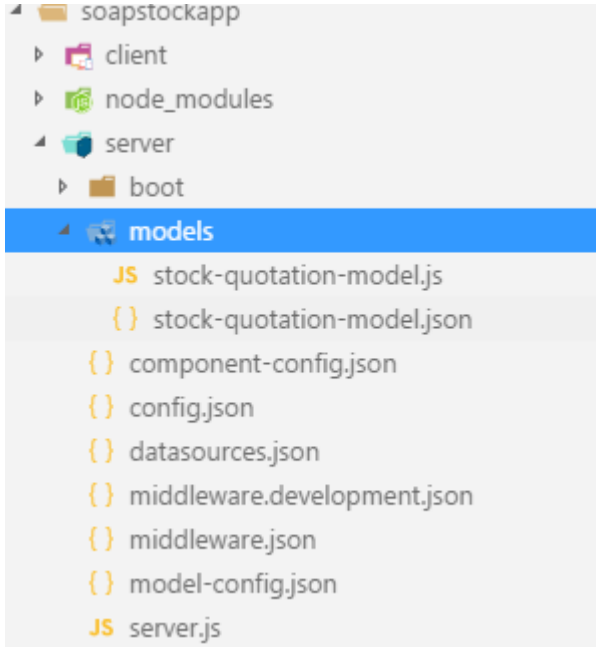
```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "soaprmconnect": {
    "url": "http://www.webservicex.net/stockquote.asmx",
    "name": "soaprmconnect",
    "wsdl": "http://www.webservicex.net/stockquote.asmx?WSDL",
    "remotingEnabled": true,
    // Map SOAP service/port/operation to Node.js methods
    "operations": {
      // The key is the method name
      "stockQuote": {
        "service": "StockQuote", // The WSDL service name
        "port": "StockQuoteSoap", // The WSDL port name
        "operation": "GetQuote" // The WSDL operation name
      },
      // The key is the method name
      "stockQuote12": {
        "service": "StockQuote", // The WSDL service name
        "port": "StockQuoteSoap12", // The WSDL port name
        "operation":"GetQuote"// The WSDL operation name
      }
    },
    "connector": "soap"
  }
}
```

SOAPSTOCK +REMOTE METHODS

Step 3

Create a SOAPQuotationModel

- create a soap quotation model




```
PS E:\CT\loopback\codeplay\soapstockapp> slc loopback:model
? Enter the model name: stockQuotationModel
? Select the data-source to attach stockQuotationModel to: soaprmconnect (soap)
? Select model's base class Model
? Expose stockQuotationModel via the REST API? Yes
? Custom plural form (used to build REST URL): NO
? Common model or server only? server
Let's add some stockQuotationModel properties now.

Enter an empty property name when done.
? Property name:
```

Adding application logic

- When building an application, we generally need to **implement custom logic to process data and perform other operations before responding to client requests.**
  - **Adding logic to models**
    - **Remote methods**
    - **Remote hooks**
    - **Operation hooks**
  - **Defining custom boot scripts, which run on application boot.**
  - **Defining custom middleware**

Remote Methods

- It is a static method of a model, exposed over **a custom REST endpoint.**

1

- Create a function in the model extension file. The method name determines whether a remote method is static or an instance method.
- A method name starting with **prototype. Indicates an instance method. By default, a remote method is static.**

2

- Register using JSON in the model definition JSON file.
- Registering using Javascript code in the model extension file calling remoteMethod().

https://loopback.io/doc/en/lb3/Remote-methods.html#example

SOAPSTOCK +REMOTE METHODS

Step 3

Add Custom Remote Methods

- Custom remote methods to StockQuotationModel

```
PS E:\CT\loopback\codeplay\soapstockapp> slc loopback:model
? Enter the model name: stockQuotationModel
? Select the data-source to attach stockQuotationModel to: soaprmconnect (soap)
? Select model's base class Model
? Expose stockQuotationModel via the REST API? Yes
? Custom plural form (used to build REST URL): NO
? Common model or server only? server
Let's add some stockQuotationModel properties now.

Enter an empty property name when done.
? Property name:
```

JS stock-quotation-model.js

```
'use strict';
module.exports = function (Stockquotationmodel) {
  //Remote Methods
  Stockquotationmodel.getStockQuote = function (symbol, cb) {
    Stockquotationmodel.stockQuote({
      ElementName: symbol || 'FB'
    }, function (err, response) {
      var result = response;
      cb(err, result);
    });
  };

  Stockquotationmodel.getStockQuote12 = function (symbol, callback) {
    Stockquotationmodel.stockQuote12({
      ElementName: symbol || 'IBM'
    }, function (err, response) {
      var result = response;
      callback(err, result);
    });
  };
```

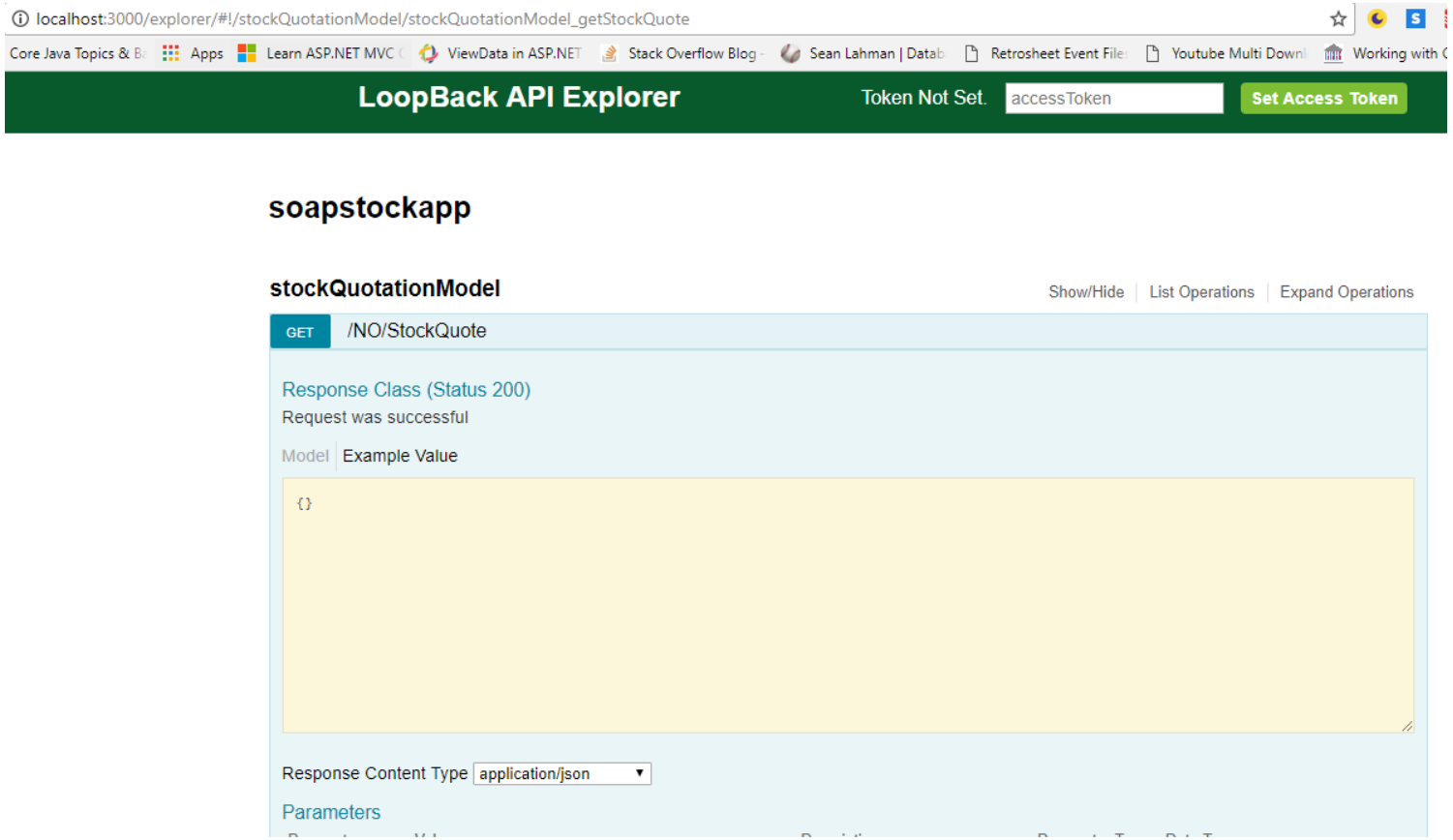
```
  // Map to REST/HTTP
  Stockquotationmodel.remoteMethod(
    'getStockQuote', {
      accepts: [{
        arg: 'symbol',type: 'string', required: true,
        http: { source: 'query' }
      }],
      returns: { arg: 'result',type: 'object',root: true  },
      http: {
        verb: 'get',
        path: '/StockQuote'
      }
    }
  );
  // Map to REST/HTTP
  Stockquotationmodel.remoteMethod(
    'getStockQuote12', {
      accepts: [{
        arg: 'symbol', type: 'string',required: true,
        http: { source: 'query'}
      }],
      returns: {
        arg: 'result', type: 'object', root: true
      },
      http: {verb: 'get',path: '/StockQuote12'}
    });
};
```

SOAPSTOCK +REMOTE METHODS

Step 4

Run your application

- Run your application to render API explorer using **node .**



Hooks

Remote Hooks

- Hooks that execute before or after calling a remote method, either a custom remote method or a standard create, retrieve, update and delete method inherited from PersistedModel.
- A remote hook enables you to execute a function before or after a remote method is called by a client.
  - beforeRemote()
  - afterRemote()
  - afterRemoteError()

Operation Hooks

- Hooks that execute when models perform create, retrieve, update and delete operations.
- They replace deprecated model hooks.
- They are triggered by all methods that execute a particular high-level create,read, update or delete operation.

Operation Hook

Method Operation hook	find findOne findById	exists	count	create	upsert	findOrCreate	deleteAll deleteById	updateAll	prototype .save	prototype .delete	prototype .updateAttributes
access	X	X	X		X	X	X	X			
before save				X	X	X		X	X		X
after save				X	X	X		X	X		X
before delete							X			X	
after delete							X			X	
loaded	X	X	X	X	X	X			X		X
persist				X	X	X		X	X		X

Connector hook

- Connector hooks are triggered by actions of connectors
- Connectors are responsible for interacting with the backend systems on behalf of model methods.
- Connector hooks enable applications to intercept the connector execution.
  - Before execute
  - After execute

REMOTE METHODS ON MODELS AND VALIDATIONS

SLC LOOPBACK:DEMO-XI

Playbook for creating soap connect with remote methods

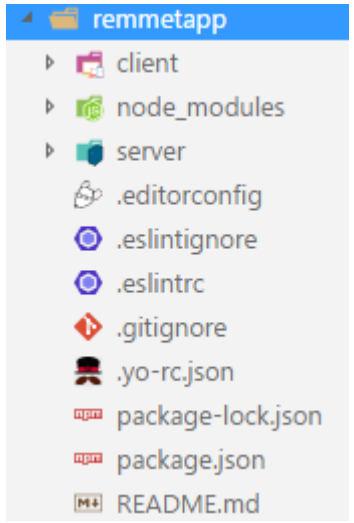
1. Bootstrap the application
   - Slc loopback remmetapp
2. Create a soap data source
   - Slc loopback:datasource
3. Create a shoppingcart model
   - Slc loopback:model
4. Add static remote methods to server models
   - Add custom logic to javascript (model)
5. Run your application
   - Node .

REMOTE METHODS ON MODELS

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
PS E:\CT\loopback\codeplay> slc loopback remmetapp

     _-----_
    |       |
    |--(o)--|    .--------------------------.
   `---------´   |  Let's create a LoopBack  |
    ( _´U`_ )    |       application!       |
    /___A___\    '--------------------------'
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? remmetapp
? Enter name of the directory to contain the project: remmetap
p
   create remmetapp/
     info change the working directory to remmetapp

? Which version of LoopBack would you like to use? 3.x (curren
t)
? What kind of application do you have in mind? api-server (A
LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself.

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

Next steps:

  Change directory to your app
    $ cd remmetapp

  Create a model in your app
    $ slc loopback:model

  Run the app
    $ node .
```

REMOTE METHODS ON MODELS

Step 2

Create datasource for mongodb

- create mongdb connector datasource using slc loopback:datasource

```
PS E:\CT\loopback\codeplay> cd .\remmetapp\
PS E:\CT\loopback\codeplay\remmetapp> slc loopback:datasource
? Enter the data-source name: mongoconnect
? Select the connector for mongoconnect: MongoDB (supported by StrongLoop)
Connector-specific configuration:
? Connection String url to override other settings (eg: mongodb://username:passw
ord@hostname:port/database):
? host: localhost
? port: 27017
? user:
? password:
? database: loopcommercedb
? Install loopback-connector-mongodb@^1.4 Yes
[..................] / fetchMetadata: sill resolveWithNewModule loopback-connect
```

{ } datasources.json

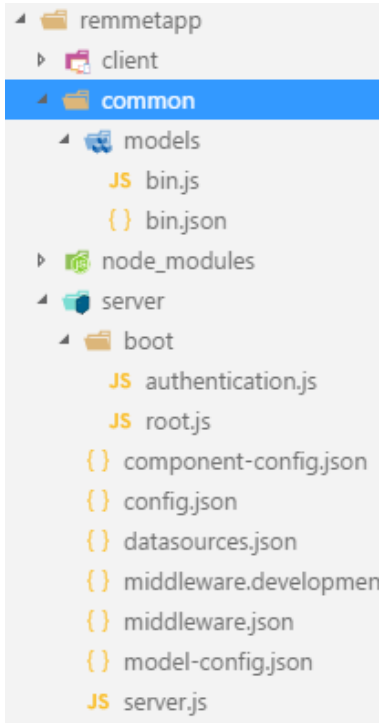
```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "mongoconnect": {
    "host": "localhost",
    "port": 27017,
    "url": "mongodb://@localhost:27017/loopcommercedb",
    "database": "loopcommercedb",
    "password": "",
    "name": "mongoconnect",
    "user": "",
    "connector": "mongodb"
  }
}
```

REMOTE METHODS ON MODELS

Step 3

Create a model returnbins

- create a model **bin** using slc loopback:model




```
PS E:\CT\loopback\codeplay\remmetapp> slc loopback:model
? Enter the model name: bin
? Select the data-source to attach bin to: mongoconnect (mongodb)
? Select model's base class PersistedModel
? Expose bin via the REST API? Yes
? Custom plural form (used to build REST URL): bins
? Common model or server only? common
Let's add some bin properties now.

Enter an empty property name when done.
? Property name: binid
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another bin property.
Enter an empty property name when done.
? Property name: binlocation
   invoke   loopback:property
? Property type: string
? Required? Yes
? Default value[leave blank for none]:

Let's add another bin property.
Enter an empty property name when done.
? Property name:
```

REMOTE METHODS ON MODELS

Step 4

Create remote-methods on model

- create a model **bin** using slc loopback:remote-method

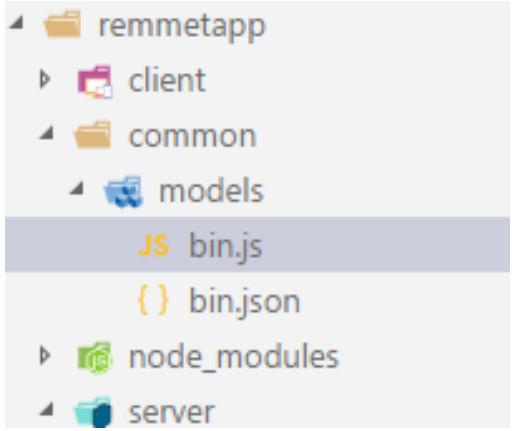
```
PS E:\CT\loopback\codeplay\remmetapp> slc loopback:remote-method
? Select the model: bin
? Enter the remote method name: refurbish
? Is Static? No
? Description for method: refurbish items returned by customers

Let's configure where to expose your new method in the public REST API.
You can provide multiple HTTP endpoints, enter an empty path when you are done.
? Enter the path of this endpoint: /refurbish
? HTTP verb: post

Let's add another endpoint, enter an empty name when done.
? Enter the path of this endpoint:

Describe the input ("accepts") arguments of your remote method.
You can define multiple input arguments.
Enter an empty name when you've defined all input arguments.
? What is the name of this argument? count
? Select argument's type: number
? Is this argument required? Yes
? Please describe the argument: no of items to refurbish
? Where to get the value from? (auto)

Let's add another accept argument, enter an empty name when done.
? What is the name of this argument?

Describe the output ("returns") arguments to the remote method's callback function.
You can define multiple output arguments.
Enter an empty name when you've defined all output arguments.
? What is the name of this argument? result
? Select argument's type: object
? Is this argument a full response body (root)? Yes
? Please describe the argument: result of number of items refurbished

Let's add another return argument. Enter empty name when done.
? What is the name of this argument?

We added strong-remoting metadata for your new method to common/models/bin.json.
You must implement the method in common\models\bin.js. For example:
Here is sample code to get you started:

/**
 * refurbish items returned by customers
 * @param {number} count no of items to refurbish
 * @param {Function(Error, object)} callback
 */

bin.prototype.refurbish = function(count, callback) {
  var result;
  // TODO
  callback(null, result);
};
```

REMOTE METHODS ON MODELS

Step 5

Create remote-methods on model

- create a model **bin** using slc loopback:remote-method




```
'use strict';

module.exports = function(Bin) {
 Bin.prototype.refurbish = function (count, callback) {
    if(count<=0){
      var err={
        statusCode:"400",
        message:"We have very few items which are refurbished, add more numbers"
      };
      callback(err);
    }
    var result={
      status:`This Store has ${count}  product items refurbished!!`
    };
    // TODO
    callback(null, result);
    //store it to the database permanently
  };
};
```

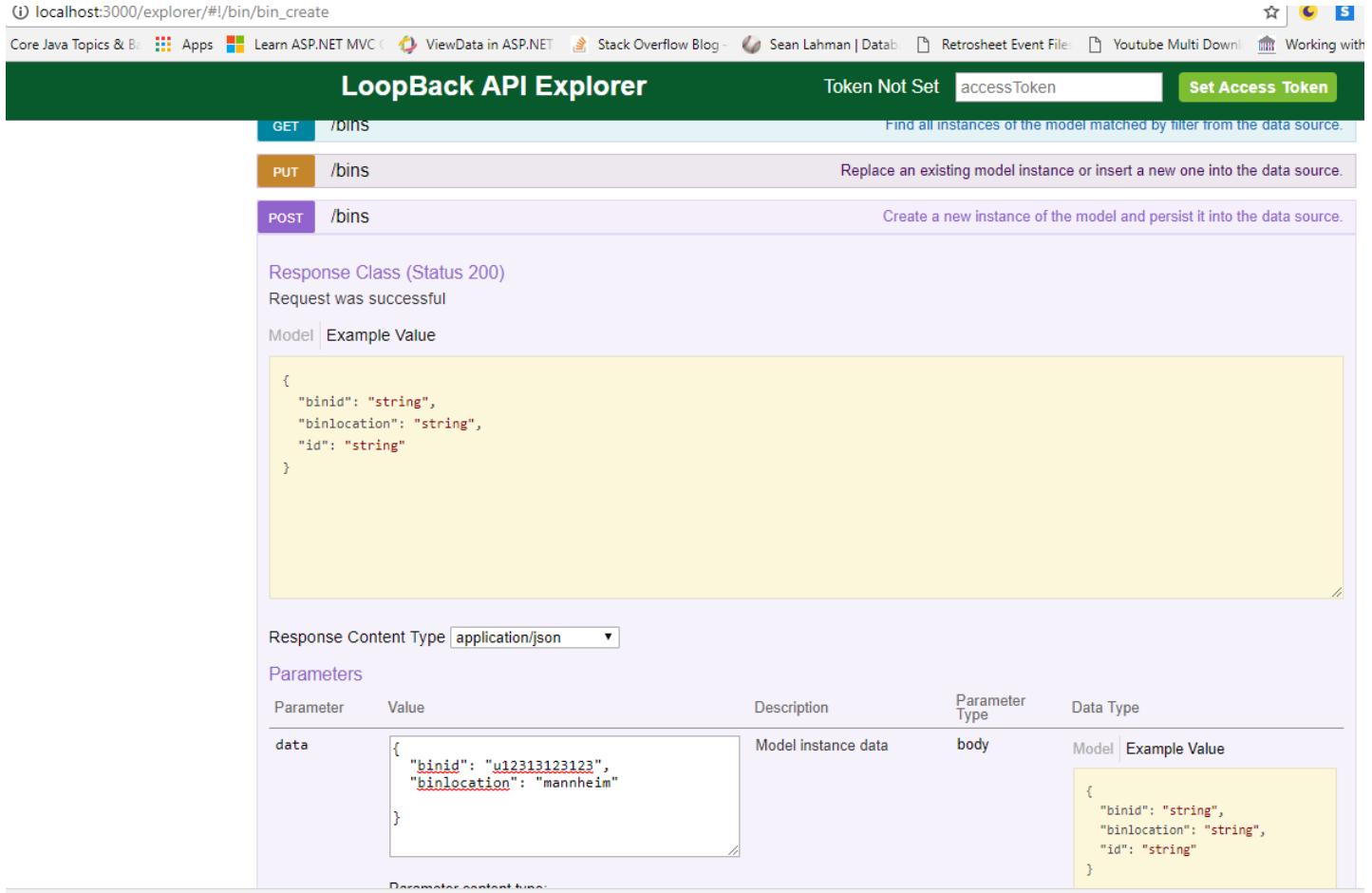
REMOTE METHODS ON MODELS

Step 6

Run your application

- run your application to render the custom remote method created.
- Run **node .**
- Now post/create **a new refurbish bin**

```
PS E:\CT\loopback\codeplay\remmetapp> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```



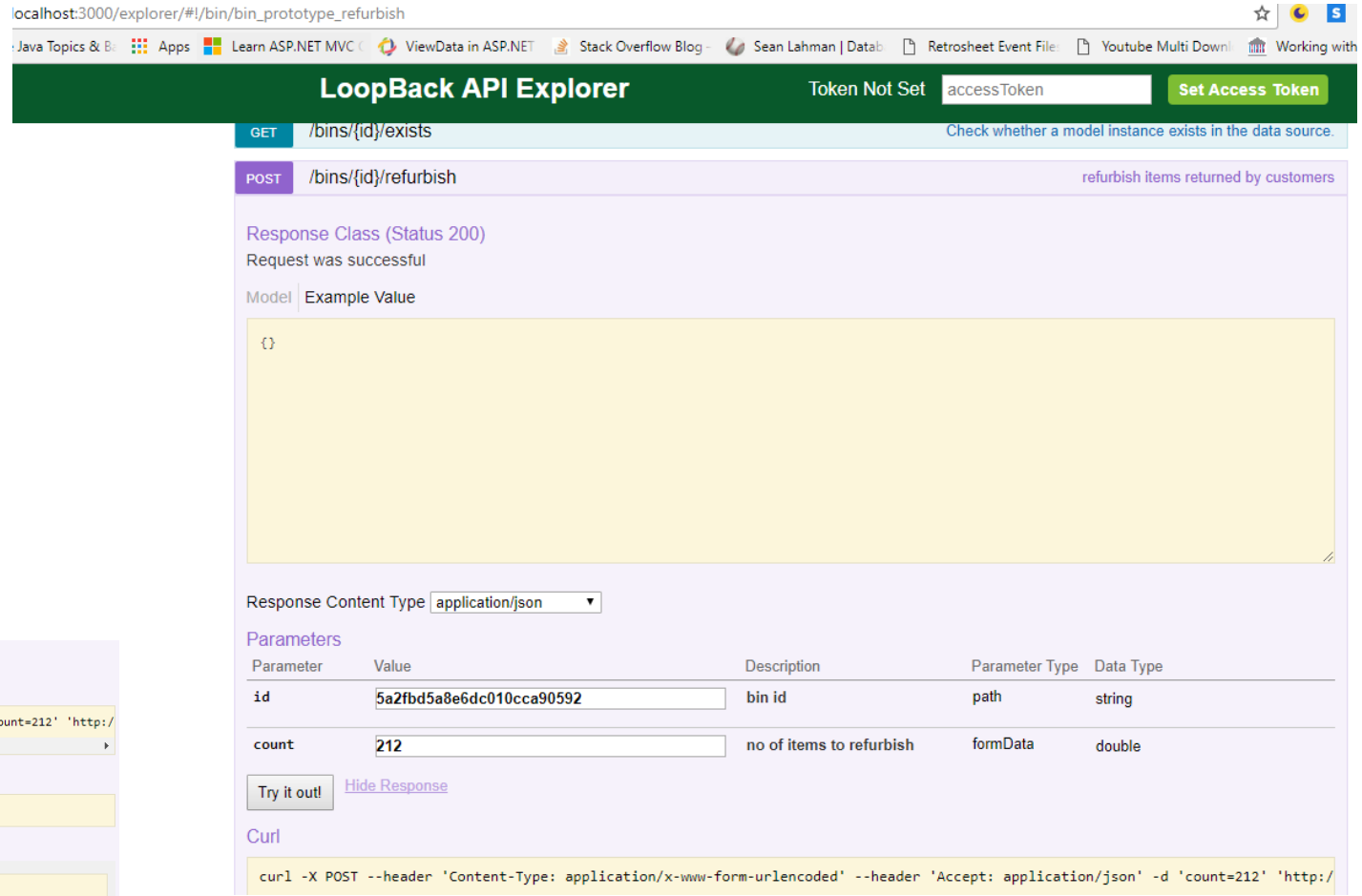
REMOTE METHODS ON MODELS

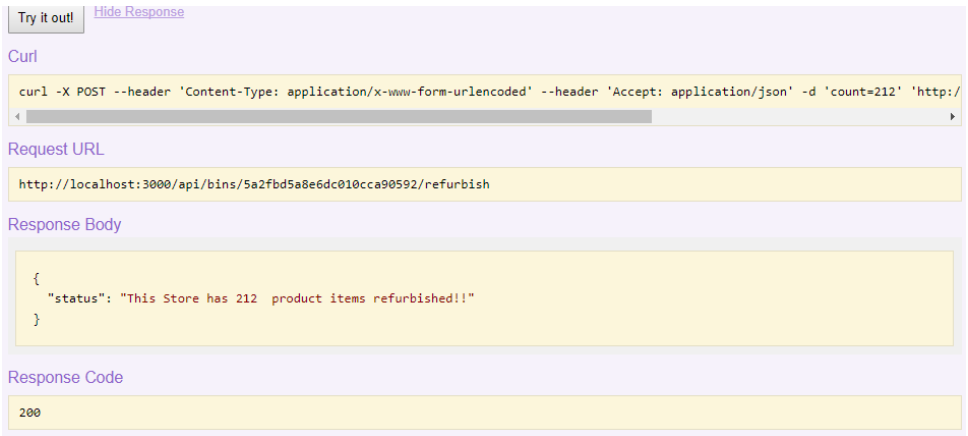
Step 7

Using remote-method

- select the refurbish bin id and add the number of items refurbished as 212.

```
PS E:\CT\loopback\codeplay\remmetapp> node .
Web server listening at: http://localhost:3000
Browse your REST API at http://localhost:3000/explorer
```





Model Validations

- A model can validate data before passing it on to a datastore such as a database to ensure that it confirms to the backend schema.
- Schema imposes restrictions on the model, to ensure that the model will save data that matches the corresponding database table.
- Loopback ensures that the data conforms to that schema definition

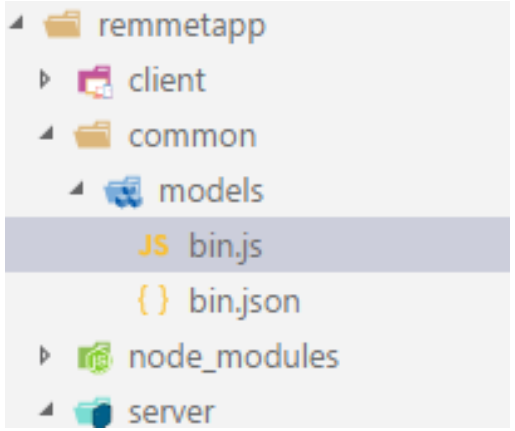
Validation method	Description
validatesAbsenceOf	Checks absence of one or more specified properties
validatesExclusionOf	Validate exclusion
validatesFormatOf	Validate format
validatesInclusionOf	Validate inclusion in set
validatesLengthOf	Validate length (min, max, is)
validatesNumericalityOf	Validate numericality (int or num)
validatesPresenceOf	Validate presence of one or more specified properties
validatesUniquenessOf	Validate uniqueness.

REMOTE METHODS ON MODELS

Step 8

Create remote-methods on model

- adding model validations



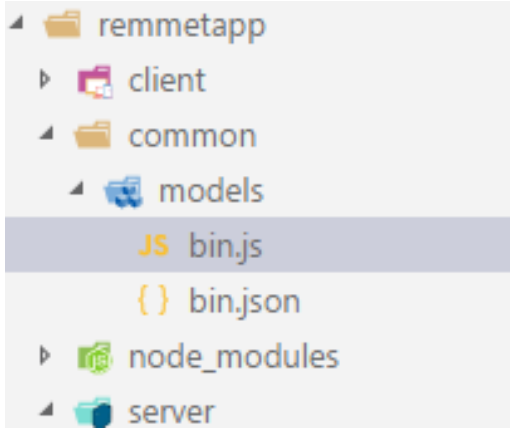

```
module.exports = function(Bin) {
//model validations
  Bin.validatesLengthOf("binlocation",{
  min:4,
  message:{min:"location of store is defined short"}
});

  //remote method
 Bin.prototype.refurbish = function (count, callback) {
    if(count<=0){
      var err={
        statusCode:"400",
        message:"We have very few items which are refurbished, add more numbers"
      };
      callback(err);
    }
    var result={
      status:`This Store has ${count}  product items refurbished!!`
    };
    // TODO
    callback(null, result);
    //store it to the database permanently
  };
};
```

REMOTE METHODS ON MODELS

Step 8

Adding validations to model

- adding model validations



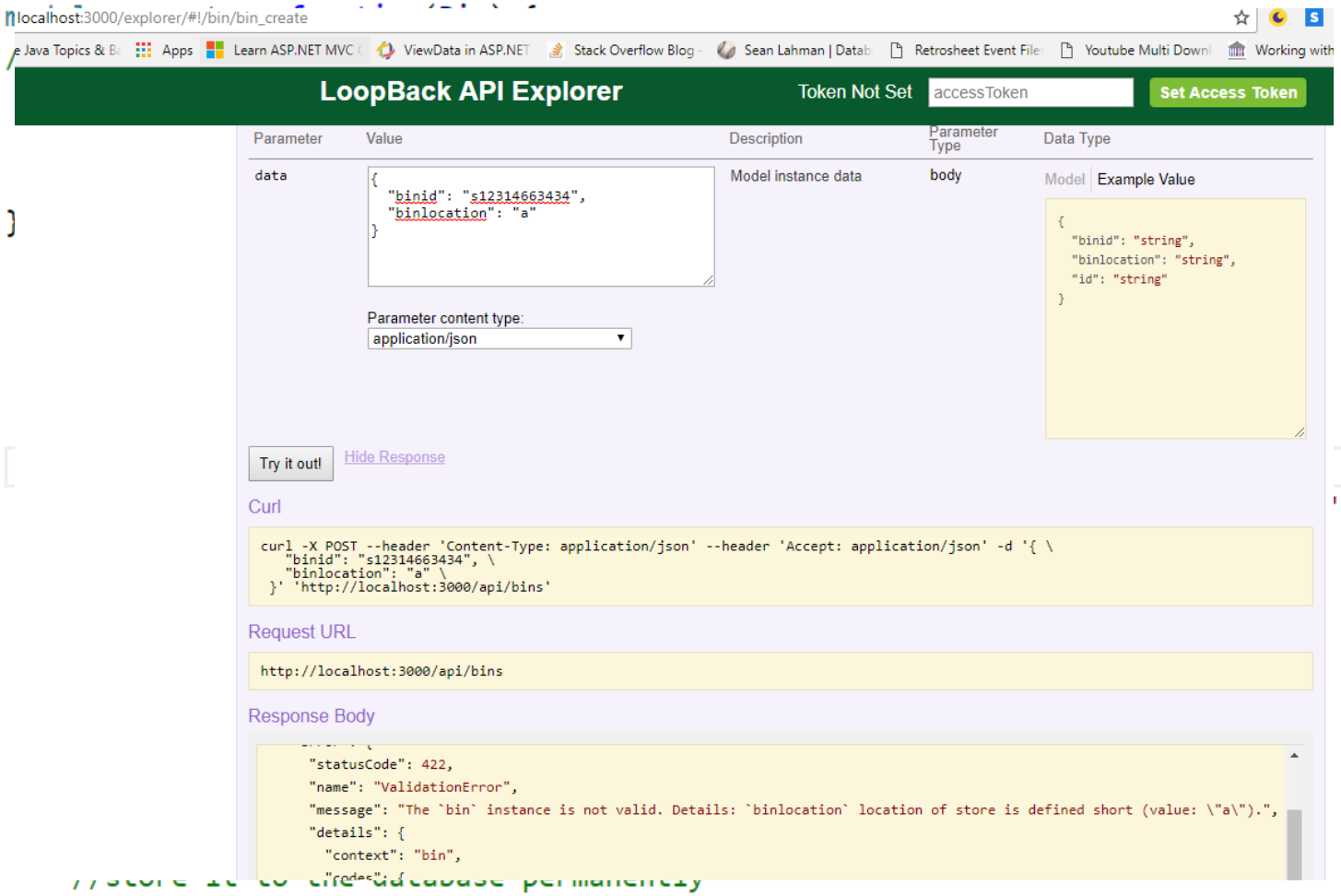

```
module.exports = function(Bin) {
//model validations
  Bin.validatesLengthOf("binlocation",{
  min:4,
  message:{min:"location of store is defined short"}
});

  //remote method
 Bin.prototype.refurbish = function (count, callback) {
    if(count<=0){
      var err={
        statusCode:"400",
        message:"We have very few items which are refurbished, add more numbers"
      };
      callback(err);
    }
    var result={
      status:`This Store has ${count}  product items refurbished!!`
    };
    // TODO
    callback(null, result);
    //store it to the database permanently
  };
};
```

REMOTE METHODS ON MODELS

Step 9

Verifying validation

- upon adding a new **binlocation with a single character, we receive a validation error as shown in the figure.**



https://loopback.io/doc/en/lb2/Validating-model-data.html

COMPONENT-STORAGE AND UPLOADING

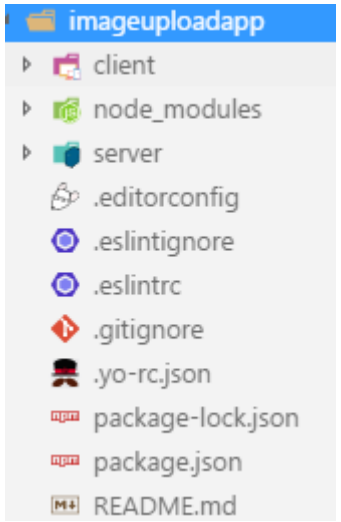
SLC LOOPBACK:DEMO-XII

COMPONENT-STORAGE

Step 1

Create API server project

- create API server project using slc loopback as shown in the figure using current version 3.x




```
PS E:\CT\loopback\codeplay> slc loopback imageuploadapp

     _-----_
    |       |
    |--(o)--|    .--------------------------.
   `---------´   |  Let's create a LoopBack  |
    ( _´U`_ )    |       application!       |
    /___A___\    '--------------------------'
     |  ~  |
   __'.___.'__
 ´   `  |° ´ Y `

? What's the name of your application? imageuploadapp
? Enter name of the directory to contain the project: imageuploadapp
   create imageuploadapp/
     info change the working directory to imageuploadapp

? Which version of LoopBack would you like to use? 3.x (current)
? What kind of application do you have in mind? api-server (A LoopBack API server with local User auth)
Generating .yo-rc.json

I'm all done. Running npm install for you to install the required dependencies. If this fails, try running the command yourself

   create .editorconfig
   create .eslintignore
   create .eslintrc
   create server\boot\root.js
   create server\middleware.development.json
   create server\middleware.json
   create server\server.js
   create README.md
   create server\boot\authentication.js
   create .gitignore
   create client\README.md

                        Next steps:

          Change directory to your app
            $ cd imageuploadapp

          Create a model in your app
            $ slc loopback:model

          Run the app
            $ node .
```

COMPONENT-STORAGE

Step 2

Create a new datasource

```
PS E:\CT\loopback\codeplay\imageuploadapp> npm install loopback-component-storage --save
[.....................] / rollbackFailedOptional: verb npm-session 456a9d6a00060eab[...................] / rollback
npm WARN deprecated gcloud@0.10.0: gcloud has been renamed to google-cloud. To get new features and bug fixes,
you must use the new package.
npm WARN deprecated node-uuid@1.4.8: Use uuid module instead
+ loopback-component-storage@3.3.1
added 69 packages in 25.518s
```

- install loopback-component-storage –save package
- Create a new data source

```
PS E:\CT\loopback\codeplay\imageuploadapp> slc loopback:datasource
? Enter the data-source name: container
? Select the connector for container: other
? Enter the connector's module name loopback-component-storage
? Install loopback-component-storage Yes
Please manually add config for your custom connector loopback-component-storage in server/datasources.json
npm WARN deprecated gcloud@0.10.0: gcloud has been renamed to google-cloud. To get new features and bug fixes, you must use the new package.
npm WARN deprecated node-uuid@1.4.8: Use uuid module instead
+ loopback-component-storage@3.3.1
updated 1 package in 7.005s
```

Step 3

Create a new datasource

- update the datasource.json file

{ } datasources.json

```
{
  "db": {
    "name": "db",
    "connector": "memory"
  },
  "container": {
    "name": "container",
    "connector": "loopback-component-storage",
    "provider": "filesystem",
    "root": "./uploads"
  }
}
```

COMPONENT-STORAGE

Step 4

Create a model

- Create a container model for the data source.

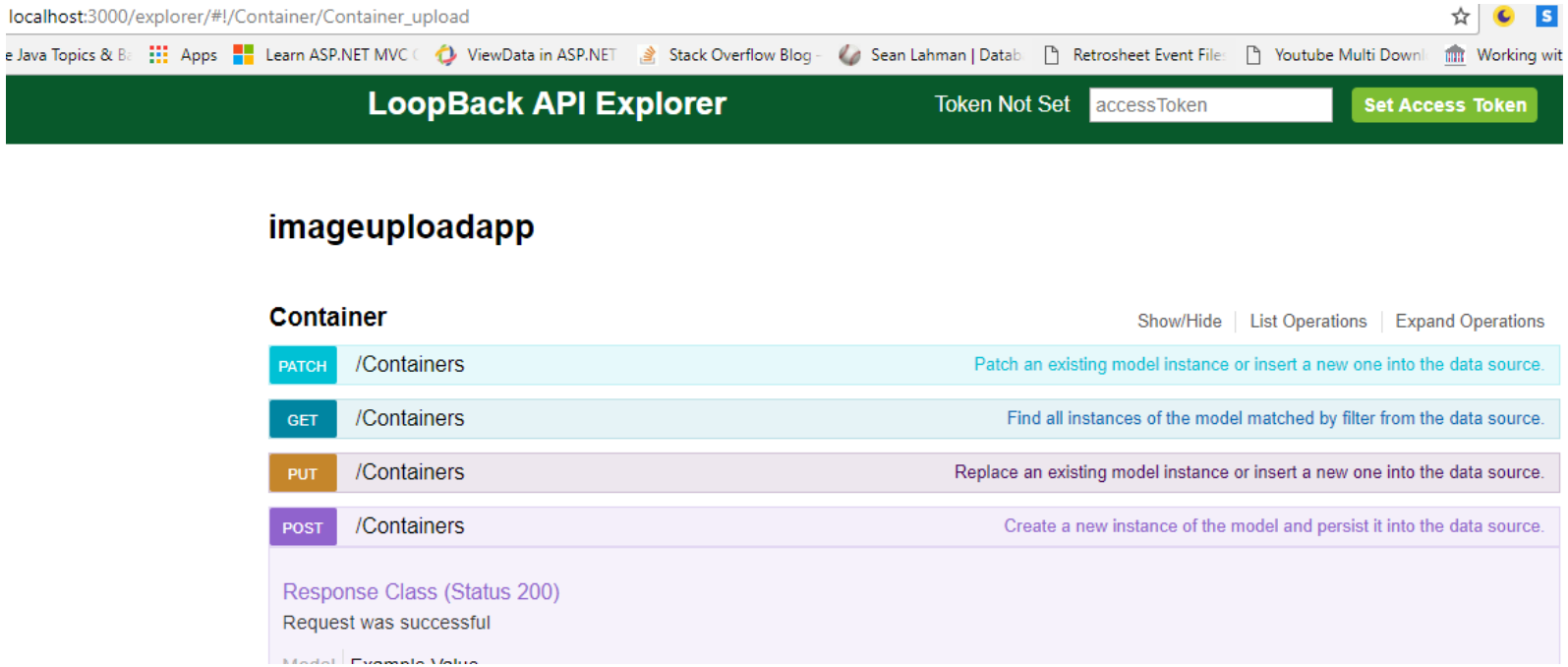
```
PS E:\CT\loopback\codeplay\imageuploadapp> slc loopback:model
? Enter the model name: Container
? Select the data-source to attach Container to: container (loopback-component-s
torage)
? Select model's base class PersistedModel
? Expose Container via the REST API? Yes
? Custom plural form (used to build REST URL):
? Common model or server only? common
Let's add some Container properties now.

Enter an empty property name when done.
? Property name:
```

https://strongloop.com/strongblog/working-with-file-storage-and-loopback/

Step 5

Run your application

- Run your application using **node .**



ANGULAR SDK

IBM OPEN API

ANGULAR SDK

SLC LOOPBACK:DEMO-

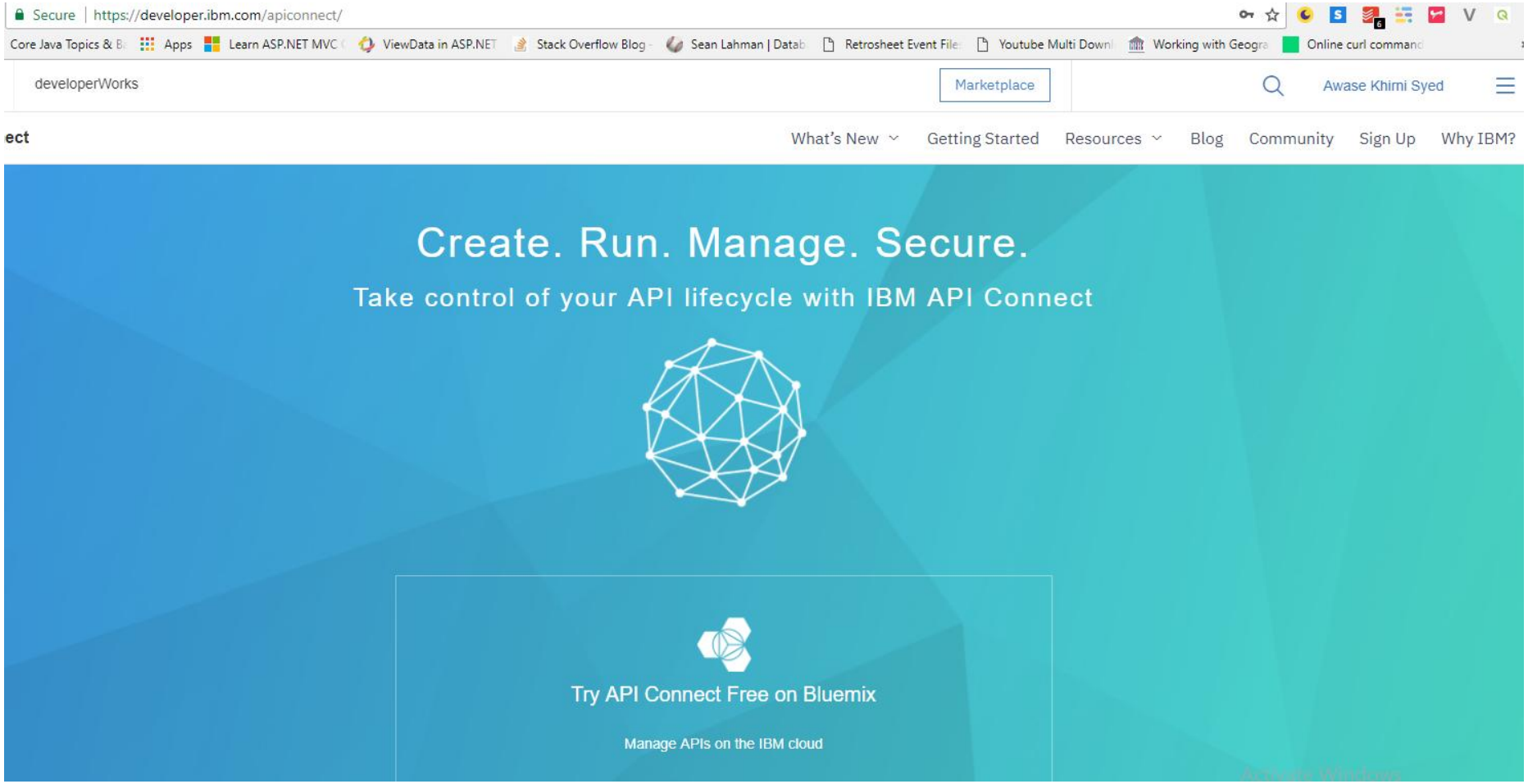
Installing SDK and Running Angular

- Installing the LoopBack Angular SDK
  - Npm install –g loopback-sdk-angular-cli
- Generate the services
  - lb-ng ./server/server.js client/www/js/services/lbservices.js
  - Dependency
    - Bower install –save angular-resource (for $resource/ngResource builtin service)

Resources

IBM API Connect

https://developer.ibm.com/apiconnect/



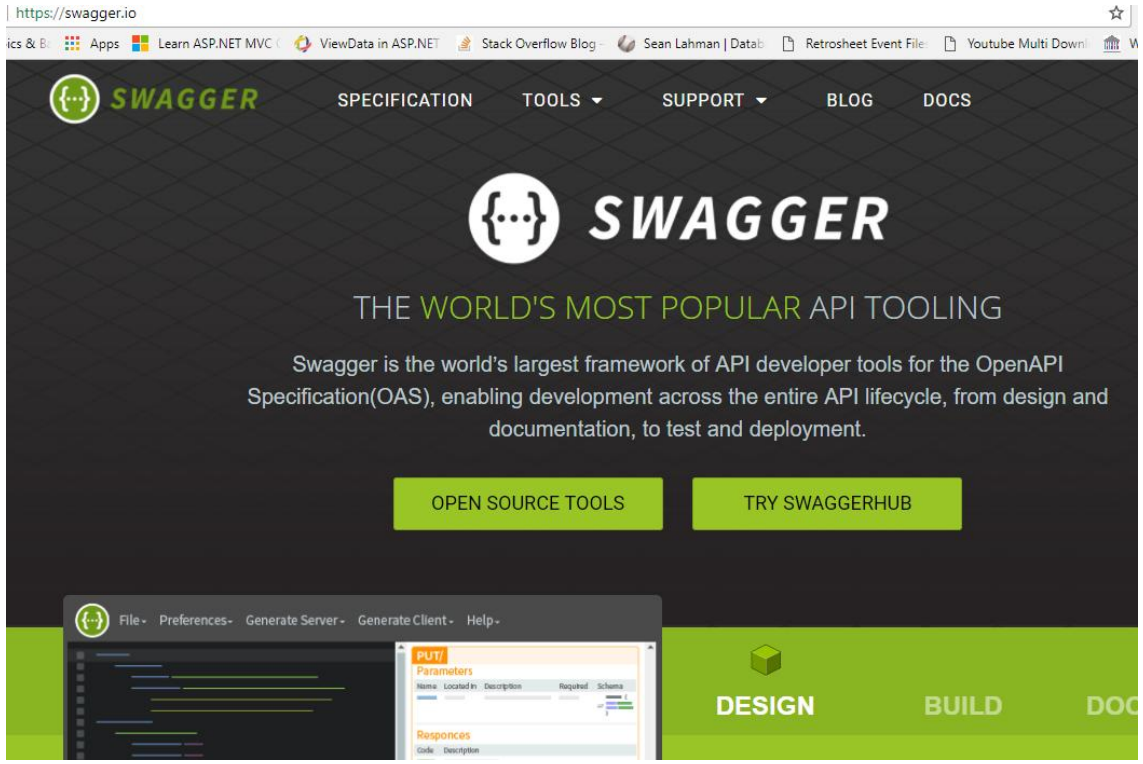
https://swagger.io/

Swagger: Pre-requisite for LoopBack

SYED AWASE KHIRNI

Swagger

https://swagger.io/



Why Swagger?

- Integration with REST APIs is troublesome and inconsistent
  - Different vendors have different REST semantics.
  - Client libraries vary wildly vendor, language.
  - Poor documentation standards
  - Input parameters, allowable values, models, responses are explored through trial and error.
  - Ad-hoc attributes

Swagger

How it works?

- Each API declares itself
  - Operations that can be performed
  - Parameters
    - Type(path,query, body)
    - Allowable values/data types
  - Input/Output models
  - Error responses with descriptions

What is Swagger?

- Swagger Spec is language agnostic
- Any swagger-compliant server can
  - Use the swagger client lib generator
  - Use the test framework
  - Use the sandbox UI

Swagger

- It is a technology framework for **producing, consuming , visualizing** RESTful APIs
- It is a methodology for **describing, documenting** RESTful APIs
- Swagger **does not support multiple API versions.**
- **It does not tell how to write the API**
- It's a JSON to specify metadata, to specify API structure and JSON schema for the model specification.
- It is machine readable and language agnostic.
- Apiary.io, masheryIO-docs are alternatives to swagger.

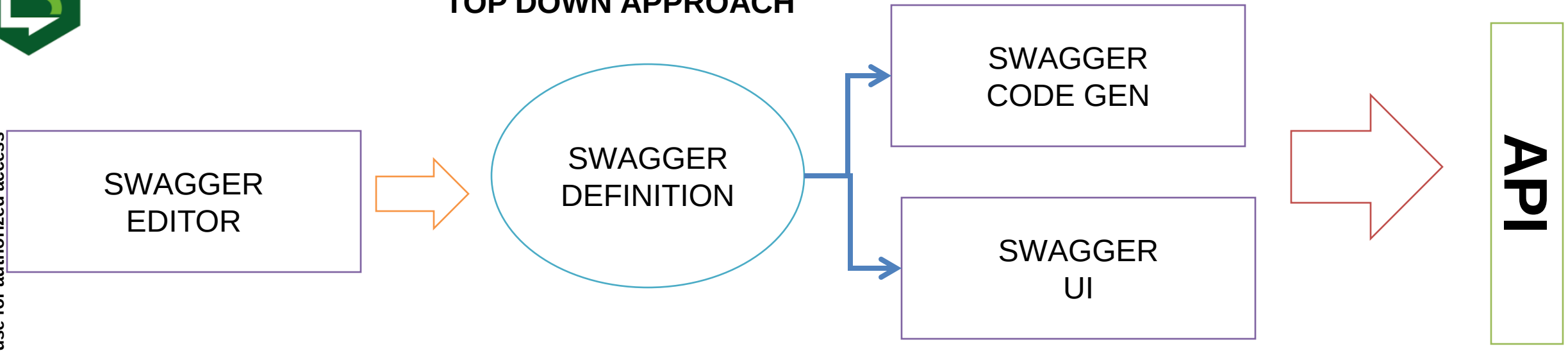
Swagger Toolset

https://swagger.io/tools/

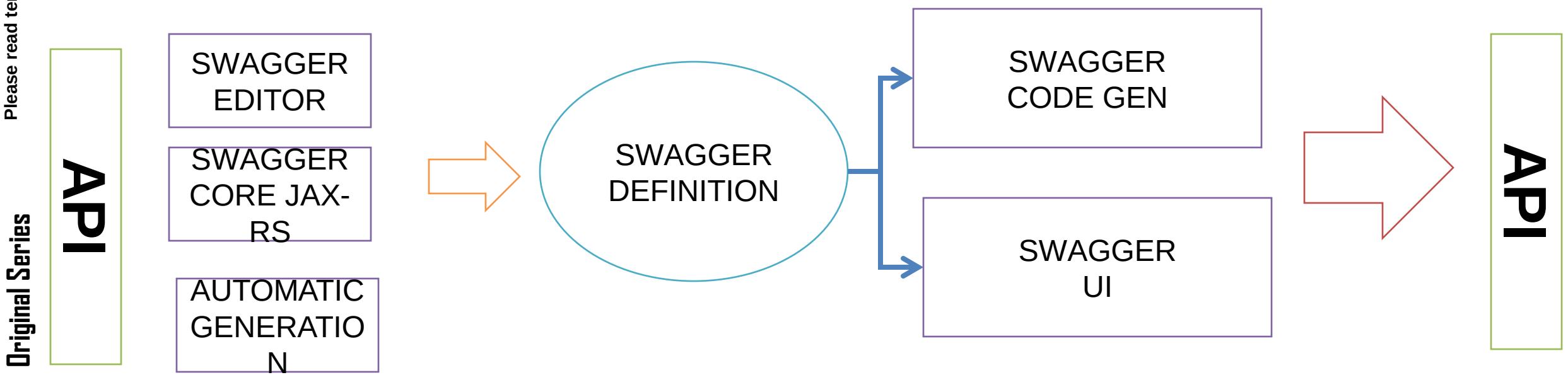
Tool	Description
Swagger Core	Java-related libraries for creating, consuming, and working with Swagger definitions
Swagger Codegen	A code generation framework for building Client SDKs, servers, and documentation from Swagger Definitions
Swagger UI	An HTML5 based UI for exploring and interacting with a Swagger defined API
Swagger Editor	Browser based editor for authoring Swagger definitions using YAML

Tool	Description
Swagger JS	Javascript library for connecting to Swagger-defined APIs from browser and node.js applications
Swagger Node	Design-driven server implementation for node.js
Swagger Parser	Standalone library for parsing Swagger definitions from Java
Validator-Badge	Standalone web service which validates swagger definitions dynamically

TOP DOWN APPROACH



BOTTOM UP APPROACH



SWAGGER OBJECTS

https://swagger.io/docs/specification/basic-structure/

Info
API metadata

paths
Available paths and operations

definitions
Data types produced and consumed by operations

parameters
Parameters that can be used across operations

responses
Responses that can be used across operations

security
Alternative security schemes that can be used

SecurityDefinitions
Security scheme definitions

tags
List of tags with additional metadata

ExternalDocs
Additional external documentation

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SWAGGER: INSTALLATION

Swagger Installation

```
PS E:\CT\loopback> cd .\swagger-codeplay\
PS E:\CT\loopback\swagger-codeplay> npm install -g swagger
```

Swagger Editor Installation

http://editor.swagger.io/?_ga=2.183538982.1851927523.1513093142-1425743669.1513093142#/

```
npm install -g http-server
wget https://github.com/swagger-api/swagger-editor/releases/download/v2.10.4/swagger-editor.zip
unzip swagger-editor.zip
http-server swagger-editor
```

```
PS E:\CT\loopback\swagger-codeplay> npm install -g swagger-cli
C:\Users\SyedAwase\AppData\Roaming\npm\swagger-cli -> C:\Users\SyedAwase\AppData\Roaming\npm\node_modules\swagger-c
+ swagger-cli@1.0.1
added 77 packages in 14.187s
```

Swagger usage

```
PS E:\CT\loopback\swagger-codeplay> swagger --help

  Usage: swagger [options] [command]


  Options:

    -V, --version  output the version number
    -h, --help     output usage information


  Commands:

    project <action>                                    project actions
    docs                                                open Swagger documentation
    validate [options] [swaggerFile]                    validate a Swagger document (supports unix piping)
    convert [options] <swaggerFile> [apiDeclarations...]  Converts Swagger 1.2 documents to a Swagger 2.0 document
    help [cmd]                                          display help for [cmd]
```

Creating a swagger project

Creating swagger project

- Swagger project create pomodotask
- Select “express”

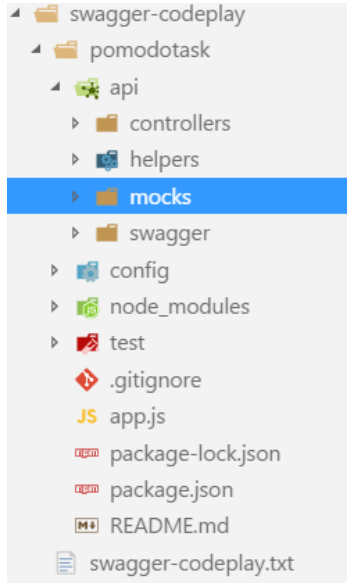
Starting swagger project

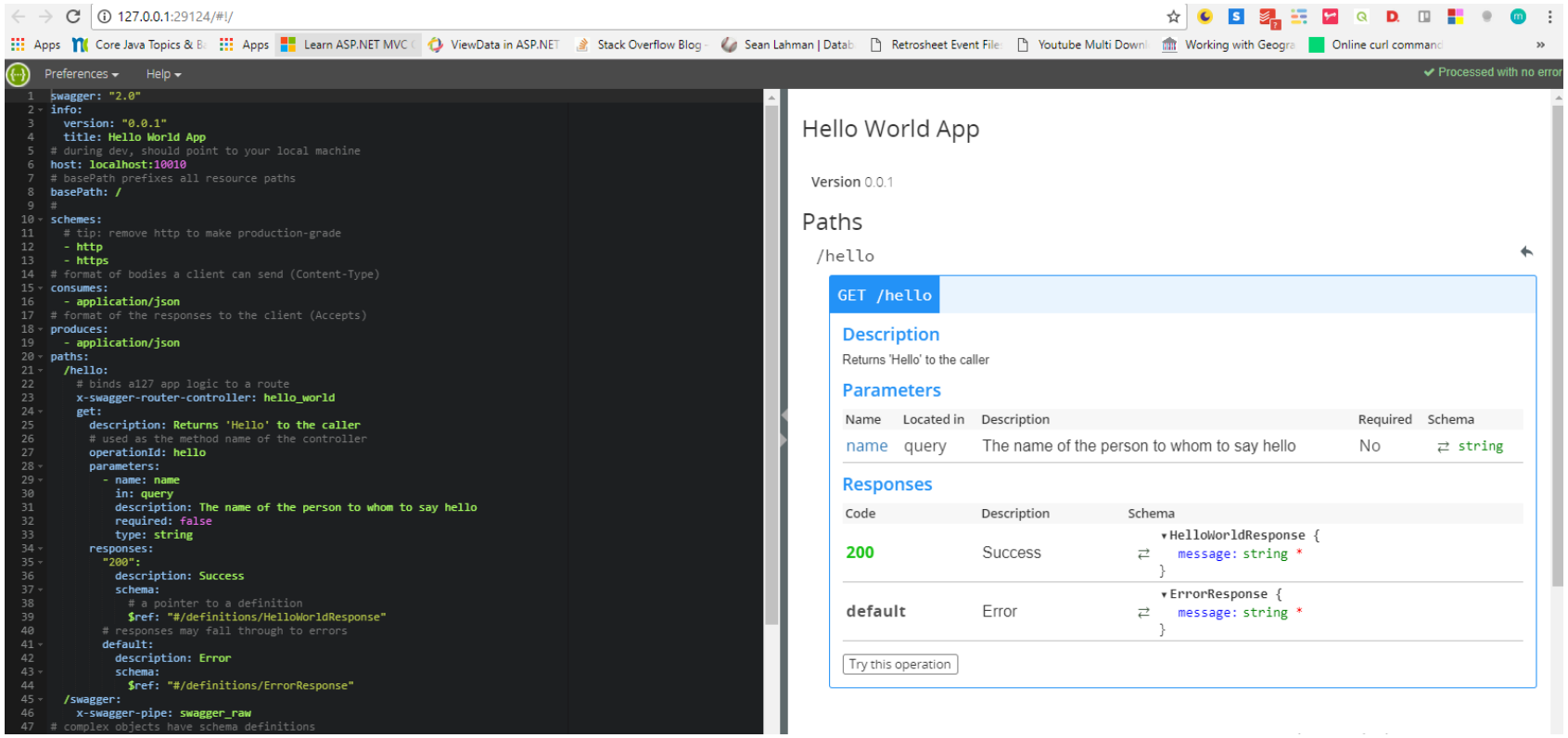
- Swagger project start pomodotask

Running Swagger Project Editor

```
PS E:\CT\loopback\swagger-codeplay\pomodotask> swagger project edit
Starting Swagger Editor.
Opening browser to: http://127.0.0.1:29124/#/edit
Do not terminate this process or close this window until finished editing.
```

http://127.0.0.1:29124/#!/





Creating our PomodoroTaskAPI


```yaml
swagger: "2.0"
info:
  version: "0.0.1"
  title: Pomodo Task API
# during dev, should point to your local machine
host: localhost:10010
# basePath prefixes all resource paths
basePath: /
#
schemes:
  # tip: remove http to make production-grade
  - http
  - https
# format of bodies a client can send (Content-Type)
consumes:
  - application/json
# format of the responses to the client (Accepts)
produces:
  - application/json
paths:
  /:
    get:
      description: "This endpoint returns all pomodoro tasks available in the database"
      operationId: "GetAllPomodoroTasks"
      parameters: []
      responses:
        200:
          description: "An array of Pomodoro Tasks"
          schema:
            type: "array"
            items:
              $ref: "#/definitions/PomodoroTask"
      x-swagger-router-controller:
        "GetAllPomodoroTasks"
```

```yaml
# complex objects have schema definitions
definitions:
  PomodoroTask:
    type: "object"
    properties:
      task_id:
        type: "integer"
        description: "taskid for pomodoro task"
      pomodoro_task:
        type: "string"
        description: "description of pomodorotask"
      pt_starttime:
        type: "integer"
        description: "time allocated to complete the task"
      pt_datecreated:
        type: "string"
        format: "date-time"
        description: "creation date of the task"
      pt_author:
        type: "string"
        description: "created by"
      pt_duedate:
        type: "string"
        format: "date-time"
        description: "task needs to be completed by due date"
      pt_taskstatus:
        type: "boolean"
        description: "status of the pomodoro task"
```

Adding a POST endpoint

```
post:
  description: "This endpoint allows us to create a new pomodoro task in the database"
  operationId: "Add PomodoroTask"
  produces:
    - "application/json"
  parameters:
  - in: "body"
    name: "pomodorotask"
    description: "the pomodoro task to be added"
    required: true
    schema:
      $ref: "#/definitions/PomodoroTask"
  responses:
    200:
      description: "Successful PomodoroTask added"
  x-swagger-router-controller:
    "AddPomodoroTask"
```

FetchbyId

```
/todo/{task_id}:
  get:
    description: "Retrieve a single pomodoro task by task_id"
    operationId: "FindById"
    produces:
    - "application/json"
    parameters:
    - name: "task_id"
      in : "path"
      description: "ID of the todo to fetch"
      required: true
      type: "integer"
      format: "int64"
    responses:
      200:
        description: "fetched a pomodoro task"
        schema:
          $ref: "#/definitions/PomodoroTask"
  x-swagger-router-controller:
    "FindById"
```

DeleteById

```
delete:
  description: "delete a pomodoro task"
  operationId: "DeleteTaskById"
  parameters:
  - name: "task_id"
    in: "path"
    description: "id of the task to be deleted"
    required: true
    type: "integer"
    format: "int64"
  responses:
    204:
      description: "todo deleted"
  x-swagger-router-controller:
    "DeleteTaskbyId"
```

Put

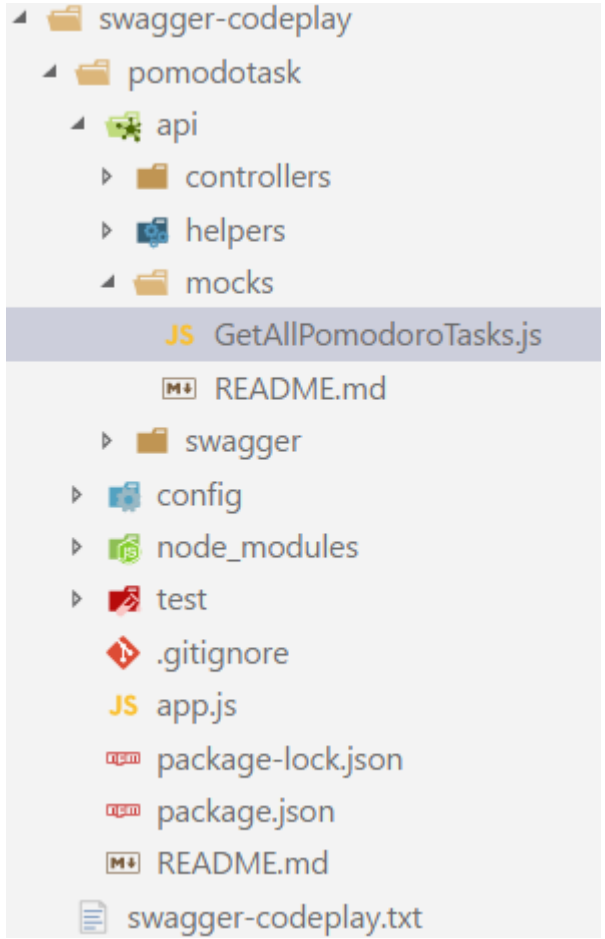
```yaml
put:
  description: "update a single to task by id"
  operationId: "UpdateTaskById"
  parameters:
  - name: "id"
    in: "path"
    description: " id of the task to be updated"
    required: true
    type: "integer"
    format: "int64"
  - name: "updated_task"
    in: "body"
    description: "the updated todo"
    required: true
    schema:
      $ref: "#/definitions/PomodoroTask"
  responses:
    200:
      description: "Task Updated"
    400:
      description: "OOPS! there was an error!"
```

Swagger mock mode

Swagger project start –m

- To render api in mock up mode

Node.js function for **getAll**



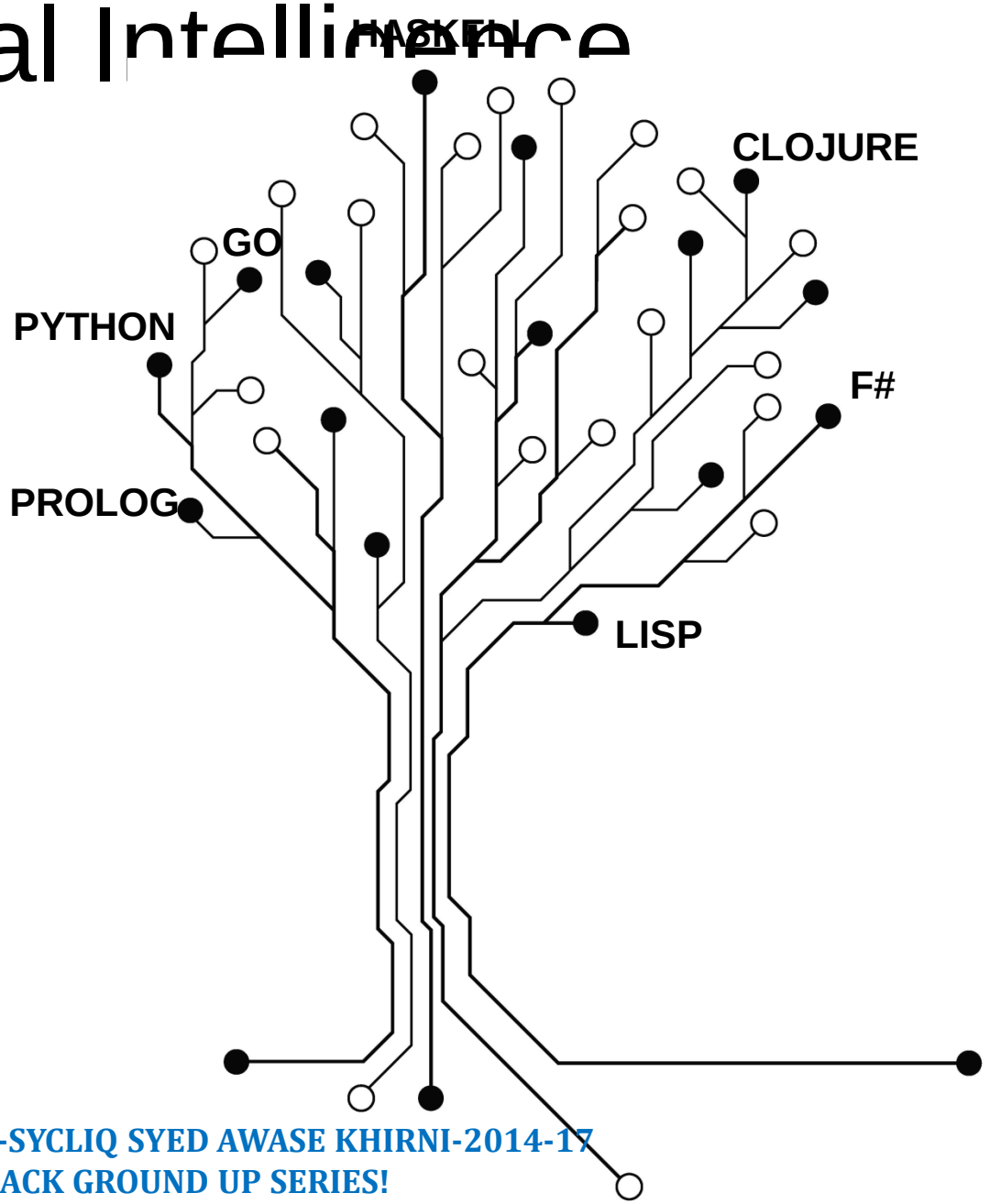

```
'use strict';
module.exports={
    GetAllPomodoroTasks: GetAllPomodoroTasks;
}

function GetAllPomodoroTasks(req,res,next){
    res.json([
        {task_id:0,
            pomodoro_task:"Complete IBM OpenAPI v5.0",
            pt_starttime:"1400",
            pt_datecreated:"2016-01-01T20:12:12:00.000Z",
            pt_author:"Syed Awase",
            pt_duedate: "2016-01-08T20:12:12:00.000Z",
            pt_taskstatus:false
        }
    ]);
}
```

Empowering You

TPRI-SYCLIQ PROGRAMS OVERVIEW

Artificial Intelligence



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Angular 4.x/Angular JS 1.5.x

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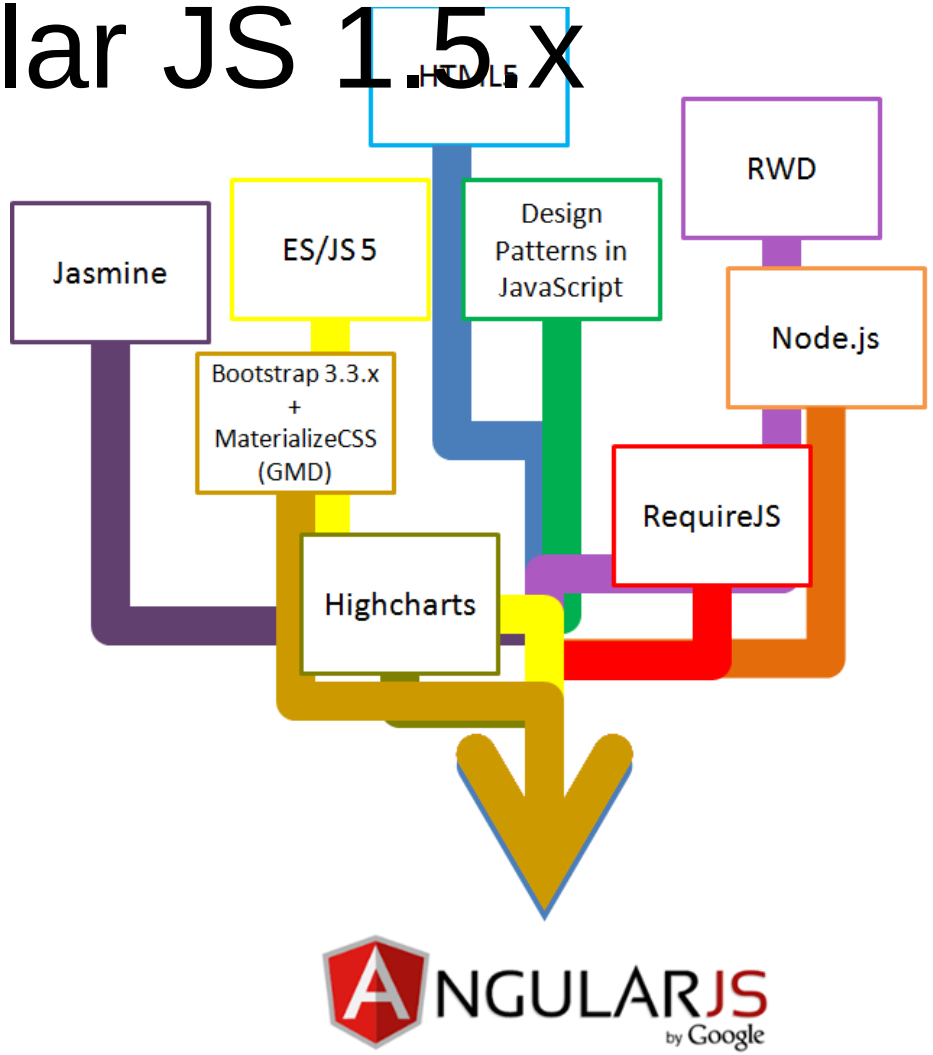

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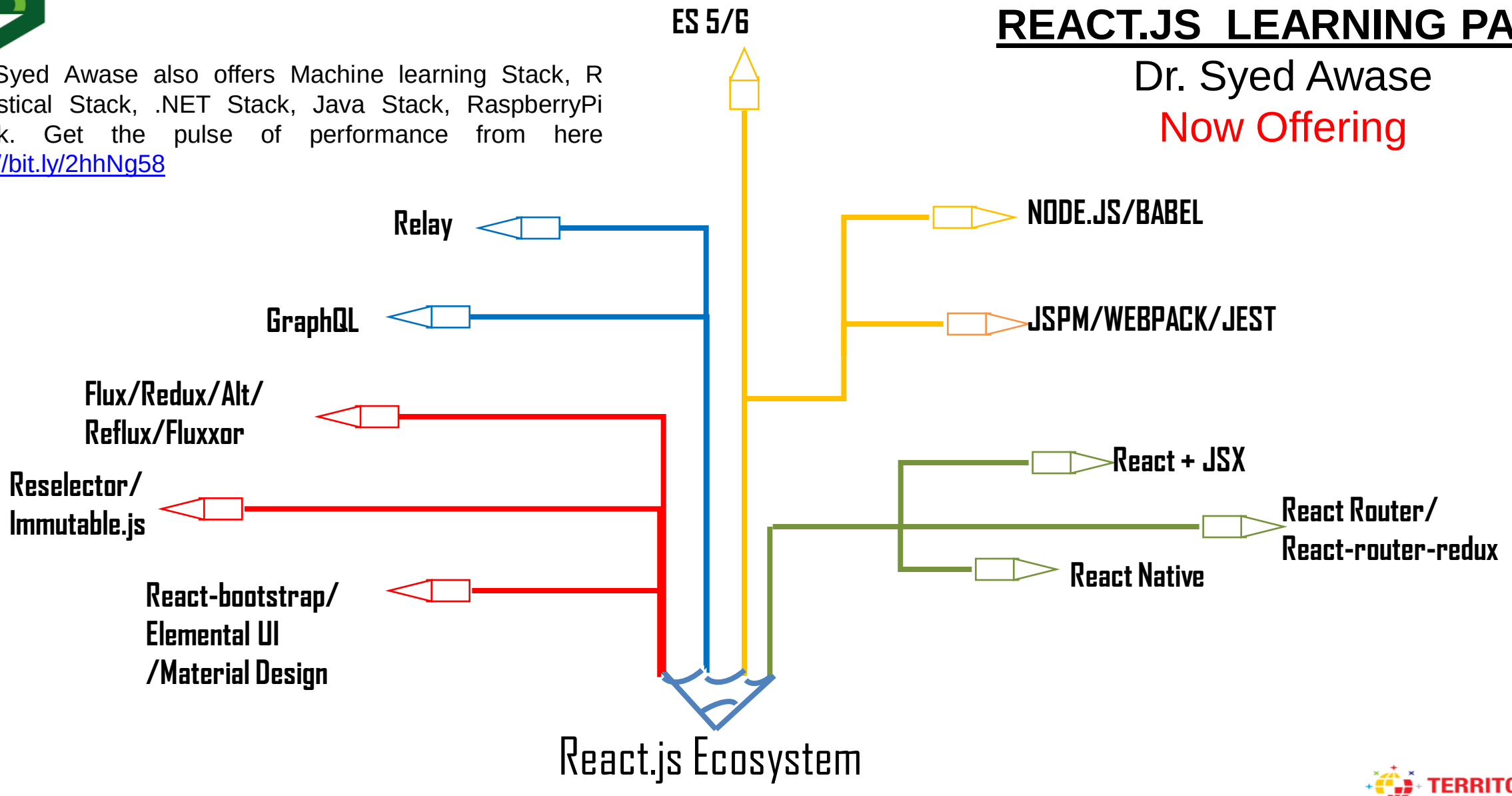

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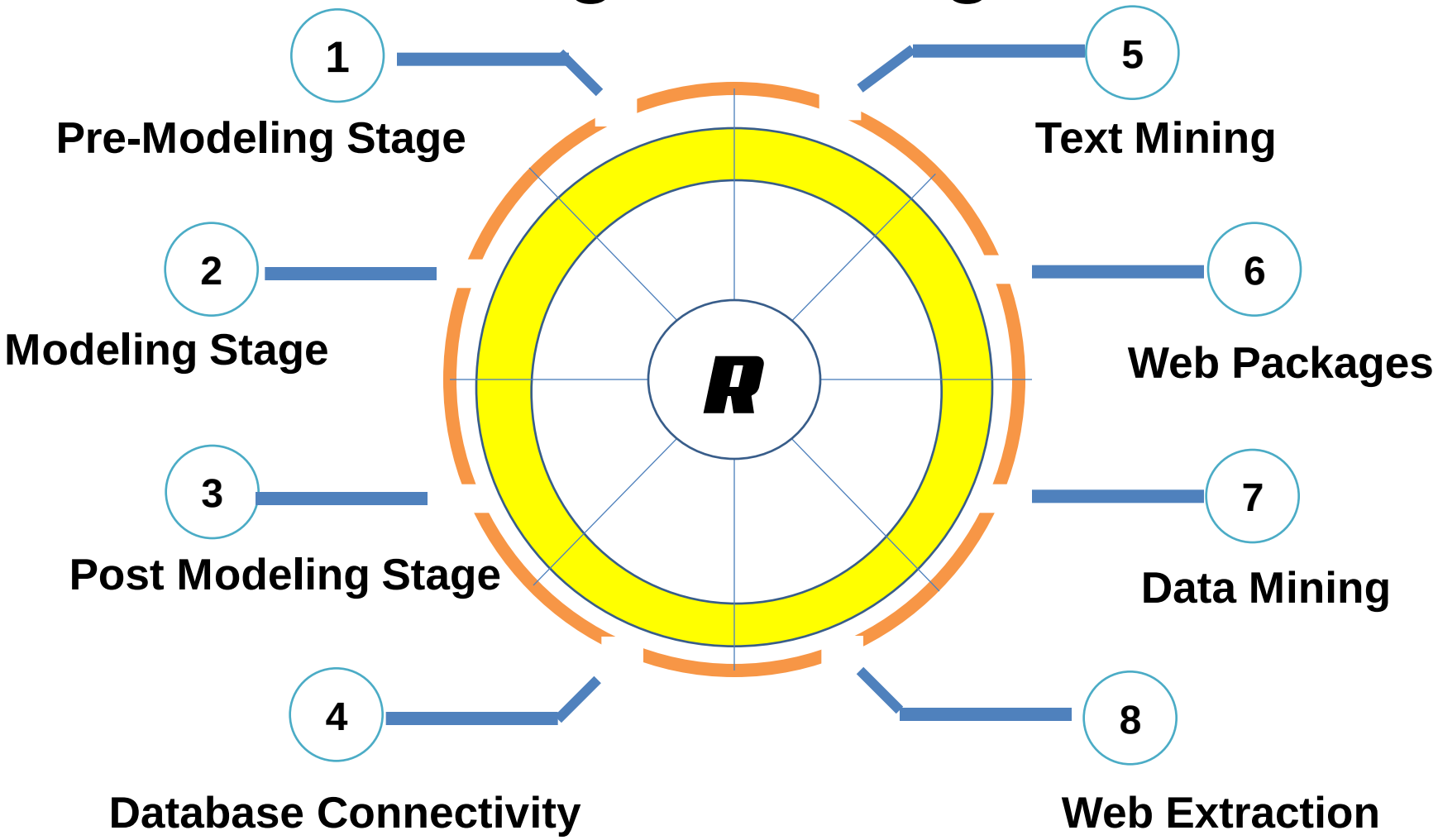

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- Hibernate
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- Play Framework
- Hadoop
- Groovy & Grails

Microsoft Technologies

- C# Core
- Entity Framework
- MVC 5/6
- Web Api
- OWIN/KATANA
- WCF
- WPF

Python

- Python
- Django
- Flask
- Numpy
- Scipy
- Machine Learning

Data Science

- R Statistical Programming
- Julia

SQL and NoSQL

- Oracle
- PostgreSQL
- MSSQL
- MongoDB
- Neo4j
- Redis
- Firebase
- Apache Cassandra

Client-Side Frameworks

- Angular JS 1.5.x
- Angular 2.4.x
- React JS
- KnockOut JS
- VueJS
- Backbone JS
- EMBER JS
- Hapi JS
- METEORJS
- MEANJS
- Coffeescript
- Dart

Others

- LISP
- CLOJURE
- RUST
- GO
- RaspberryPI
- Coming Soon
  - PHP
  - Robotic OS