API Slides ompanion

Anatomia API REST

curl -s

https://api.github.com/repos/didattica-forever/Chirpy (address API)

https://api.github.com/repos/didattica-forever/Chirpy (address API)
<filtro_username>/<filtro_reponame> (filtri)

/repos/<filtro_username>/<filtro_reponame> API

/repos/{username}/{reponame} API

result

JSON

SOAP

```
curl -X POST https://www.example.com/weatherService \
  -H "Content-Type: text/xml" \
  -d '<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <GetCityWeather xmlns="http://weather.example.com/">
      <CityName>Rome</CityName>
    </GetCityWeather>
  </soap:Body>
</soap:Envelope>'
```

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
 <soap:Body>
  <GetCityWeatherResponse>
   <GetCityWeatherResult>
    <Temperature>18</Temperature>
    <Condition>Sunny</Condition>
   </GetCityWeatherResult>
  </GetCityWeatherResponse>
 </soap:Body>
</soap:Envelope>
```

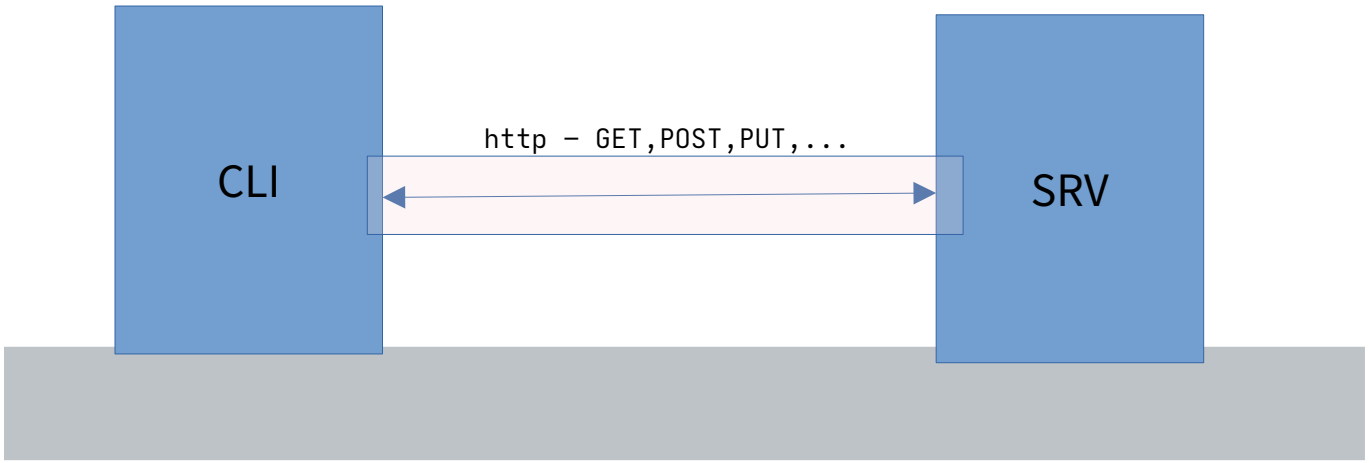
REST

REST trasferimento stato (Es: da server a client)

1) POST /customers — crea nuovo cliente (payload necessario)

2) GET /customers/{id} — profilo cliente

3) elenco di tutti i clienti? ==> GET /customers



CRUD & HTTP

CRUD	SQL	HTTP	DAO/REPO
Create	insert	POST	create
Read	select	GET	find
Update	update	PUT (100%) PATCH	update merge
Delete	delete	DELETE	delete remove

Idempotenza

PUT /devices/12 { "mode": "AUTO" } - IDEM

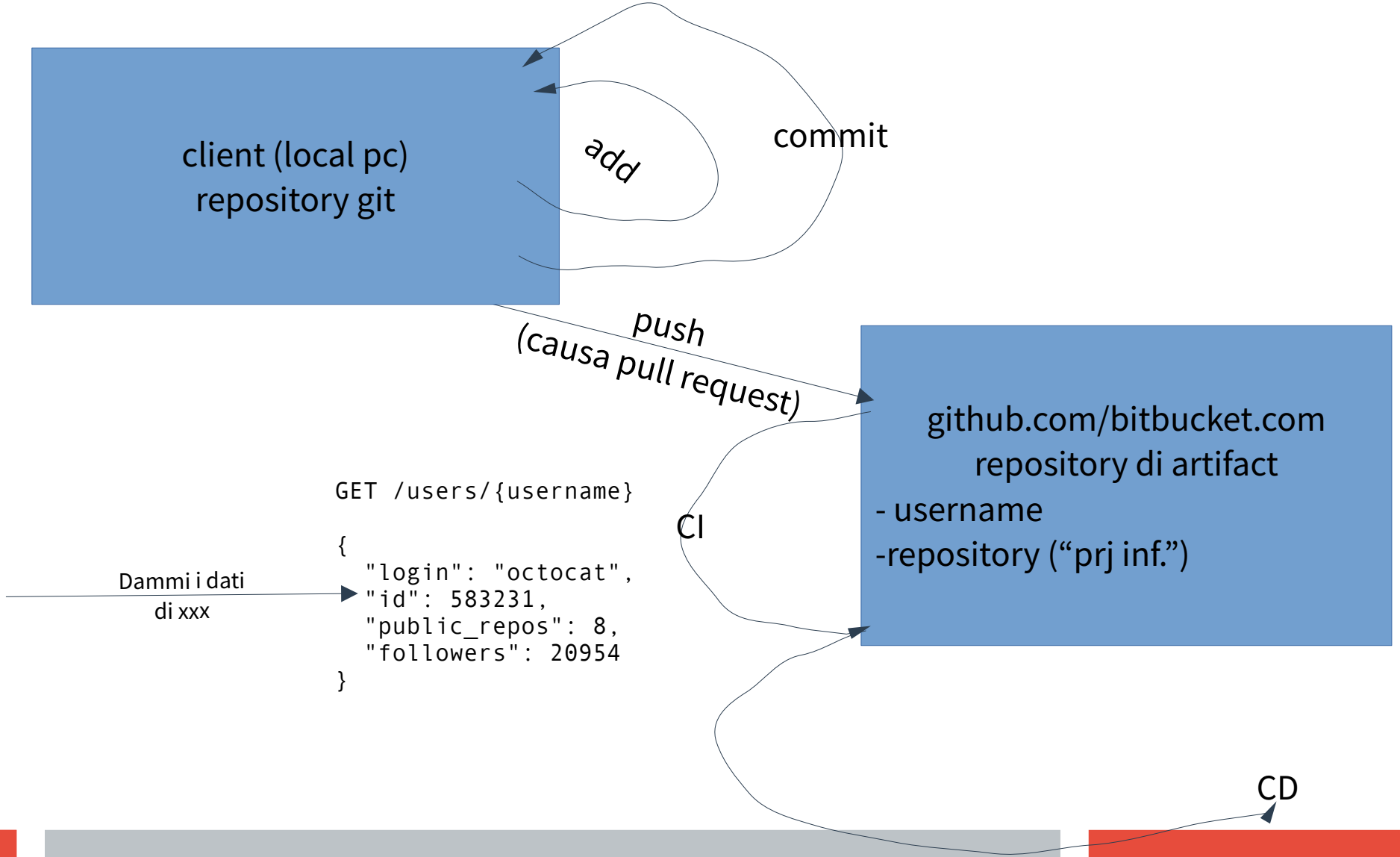
POST /logs { "event": "login" } - NO

DELETE /sessions/99 - IDEM

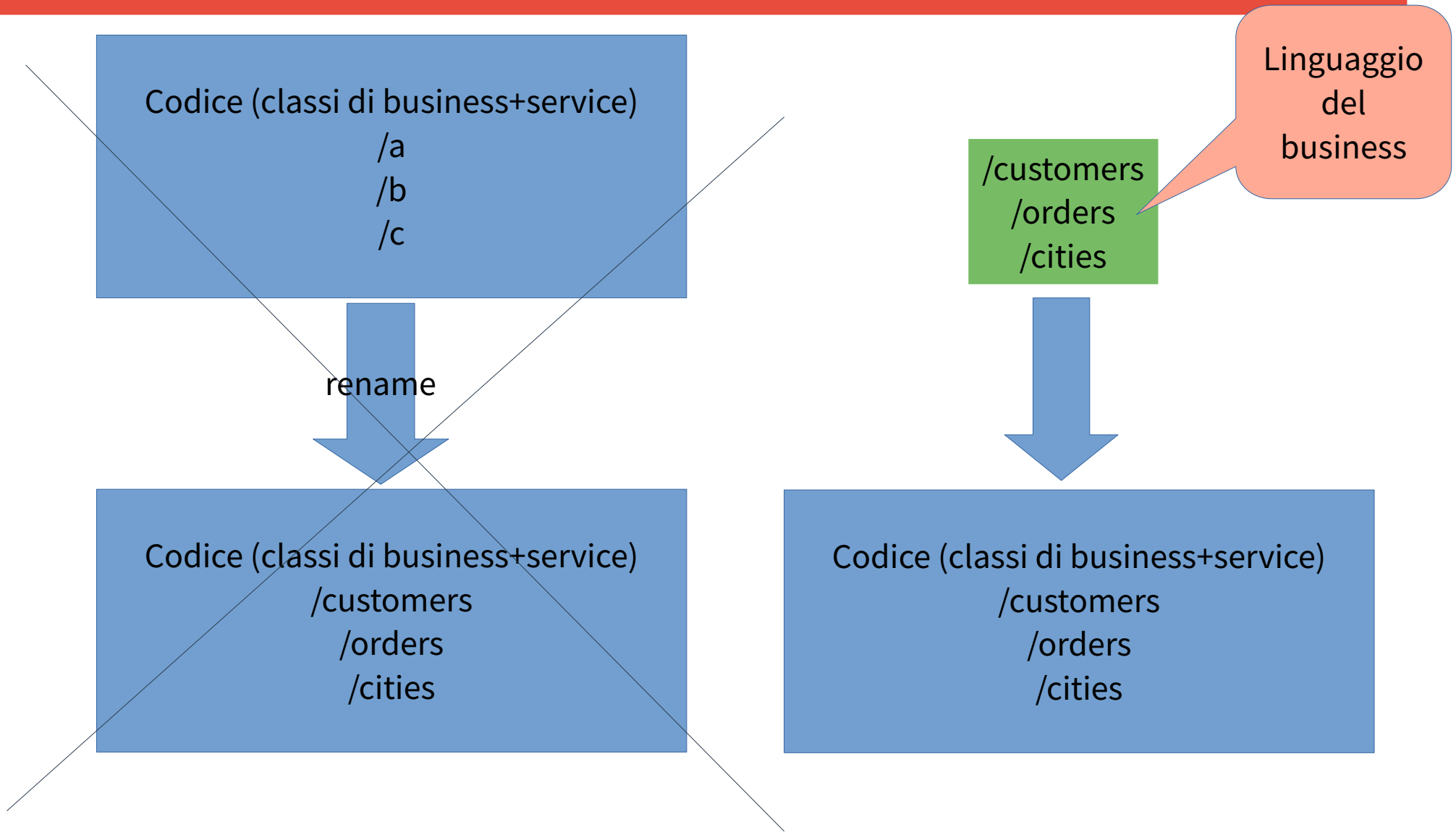
UPDATE accounts SET score = score + 1 – NO

UPDATE accounts SET saldo = credit + debit - NO

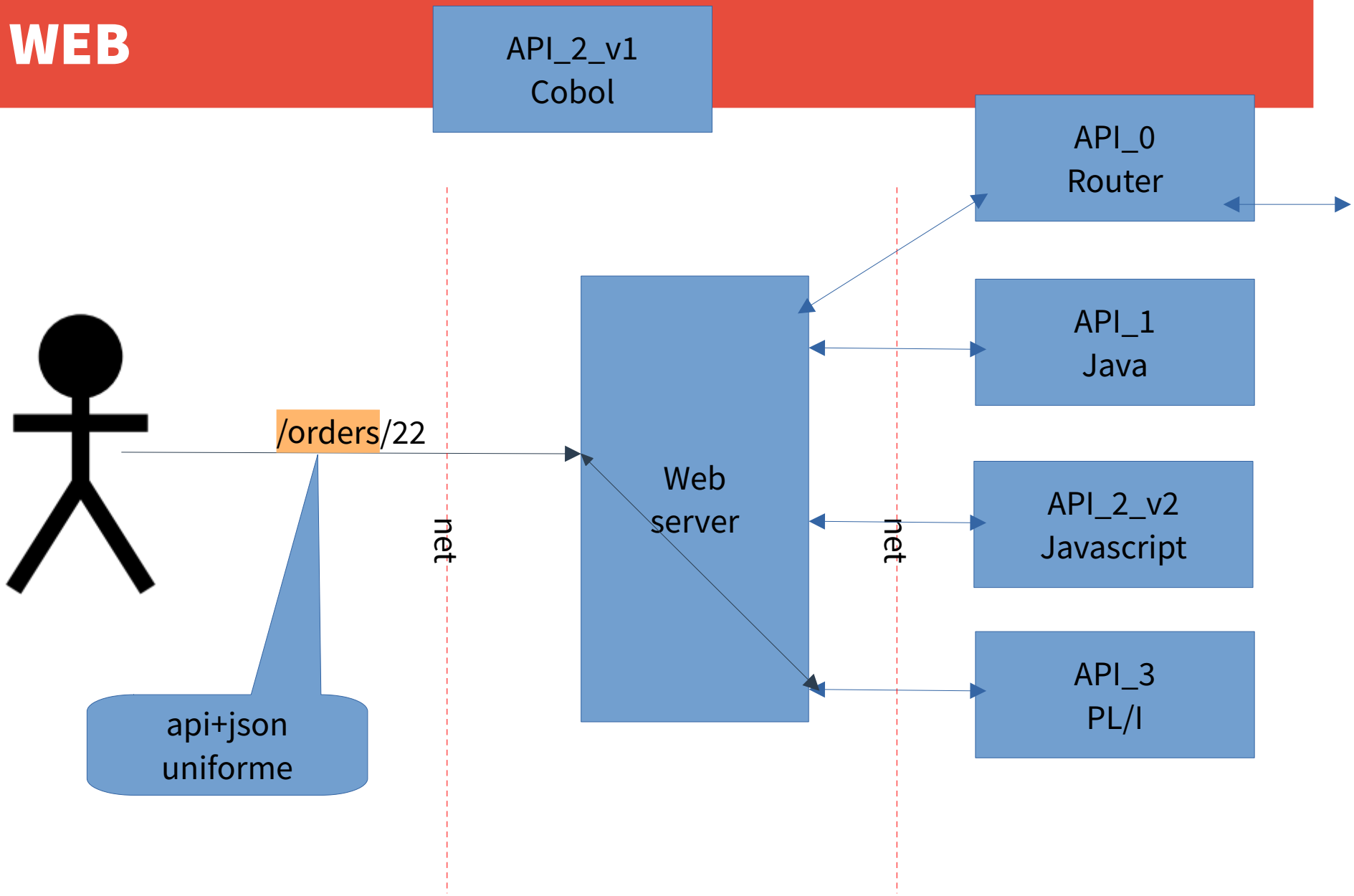
Git & Github


client (local pc)
repository git
add
commit
push
(causa pull request)
github.com/bitbucket.com
repository di artifact
- username
-repository (“prj inf.”)
CI
CD
Dammi i dati
di xxx
GET /users/{username}
{
"login": "octocat",
"id": 583231,
"public_repos": 8,
"followers": 20954
}

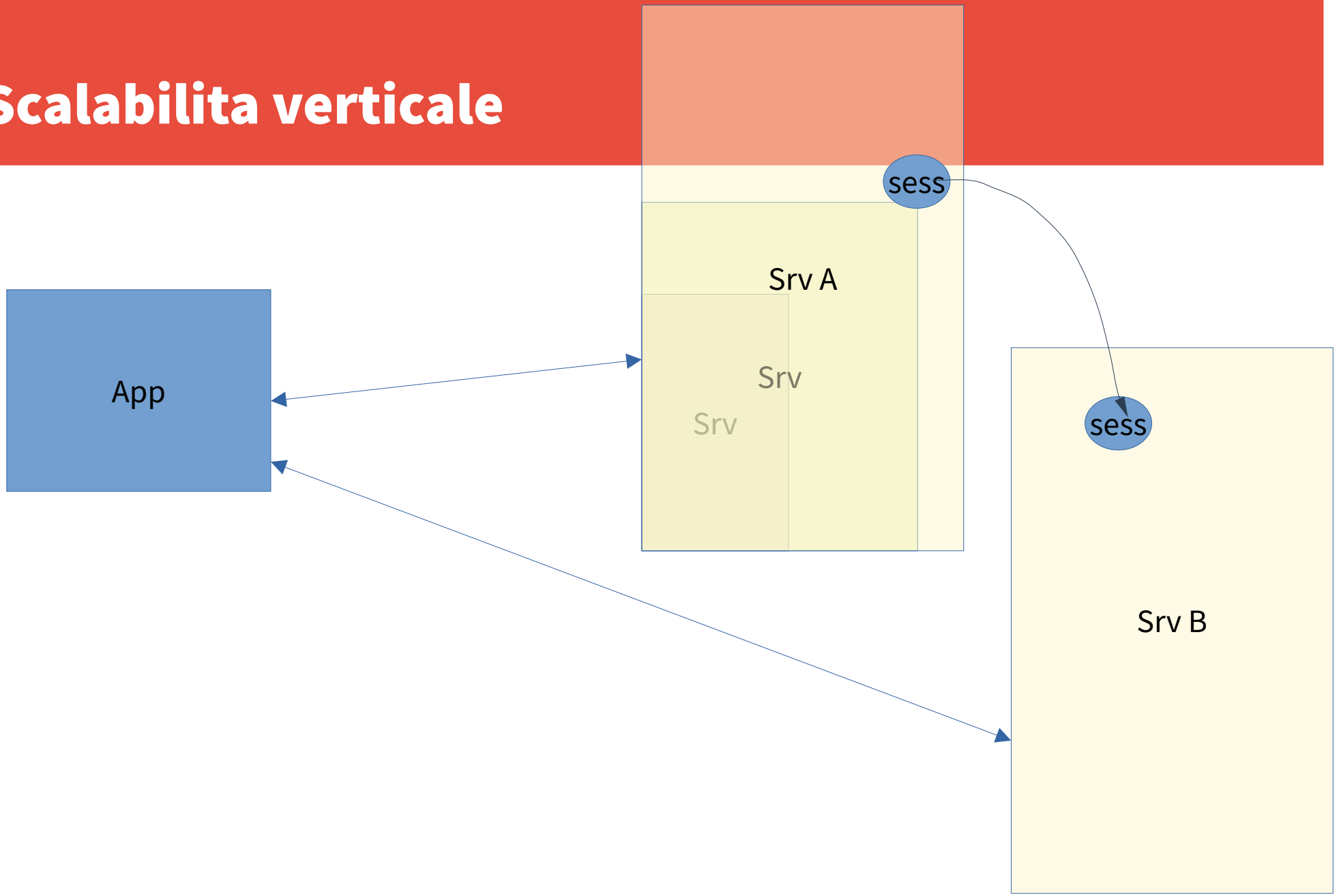
realizzazione API REST



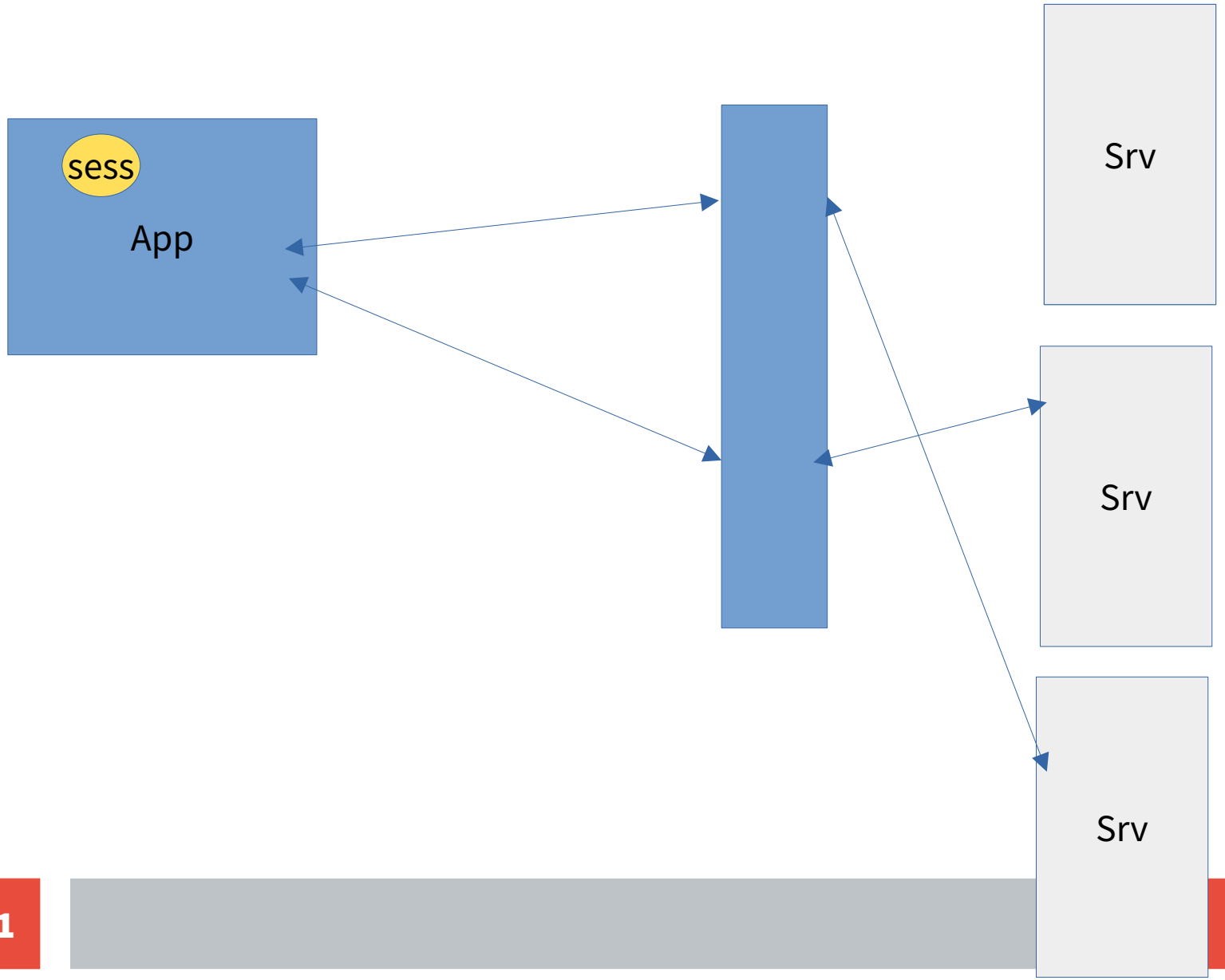
API WEB


API_2_v1
Cobol
API_0
Router
API_1
Java
API_2_v2
Javascript
API_3
PL/I
Web
server
/orders/22
api+json
uniforme
net
net

Scalabilita verticale



Scalabilita orizzontale



Cache

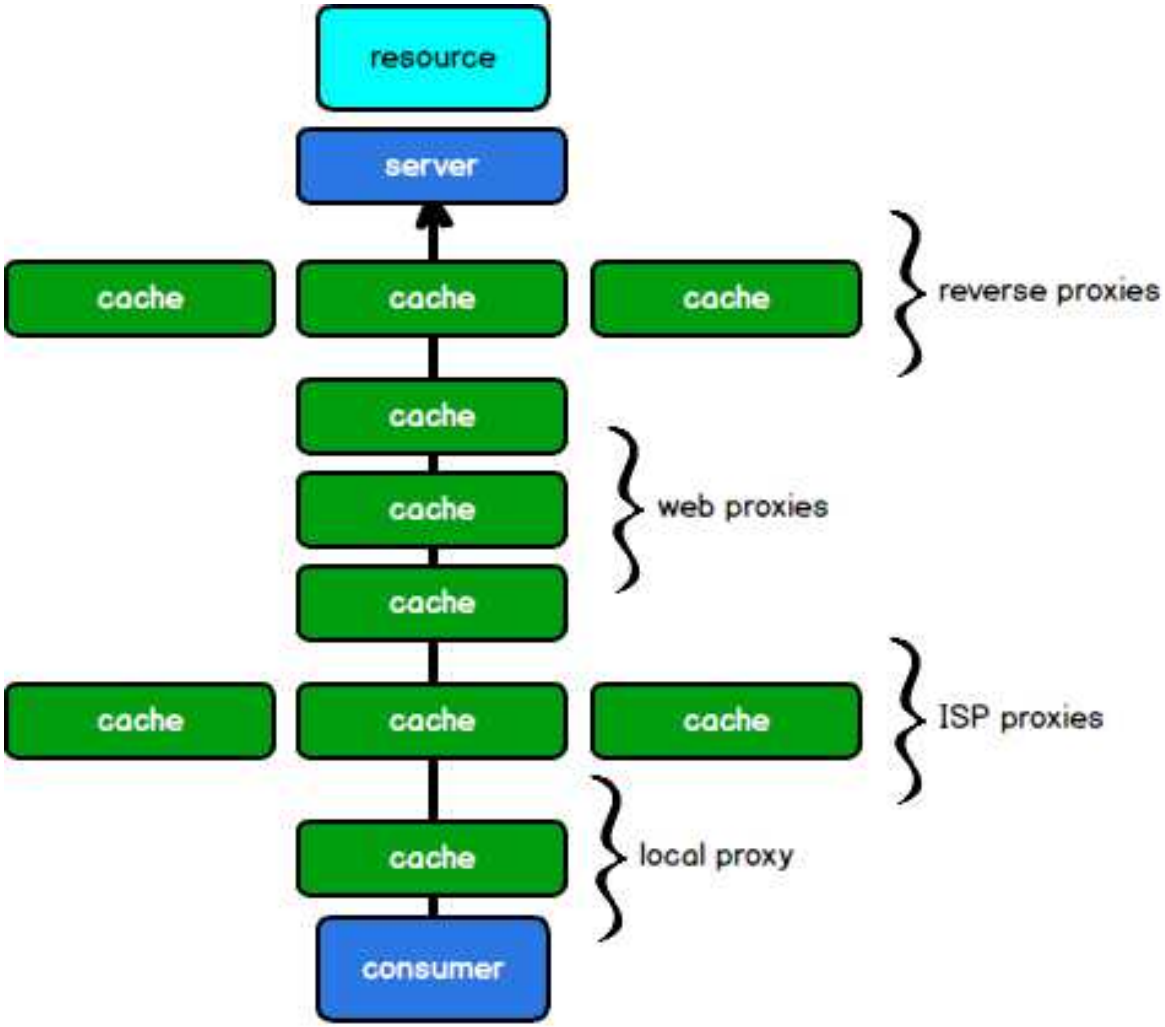
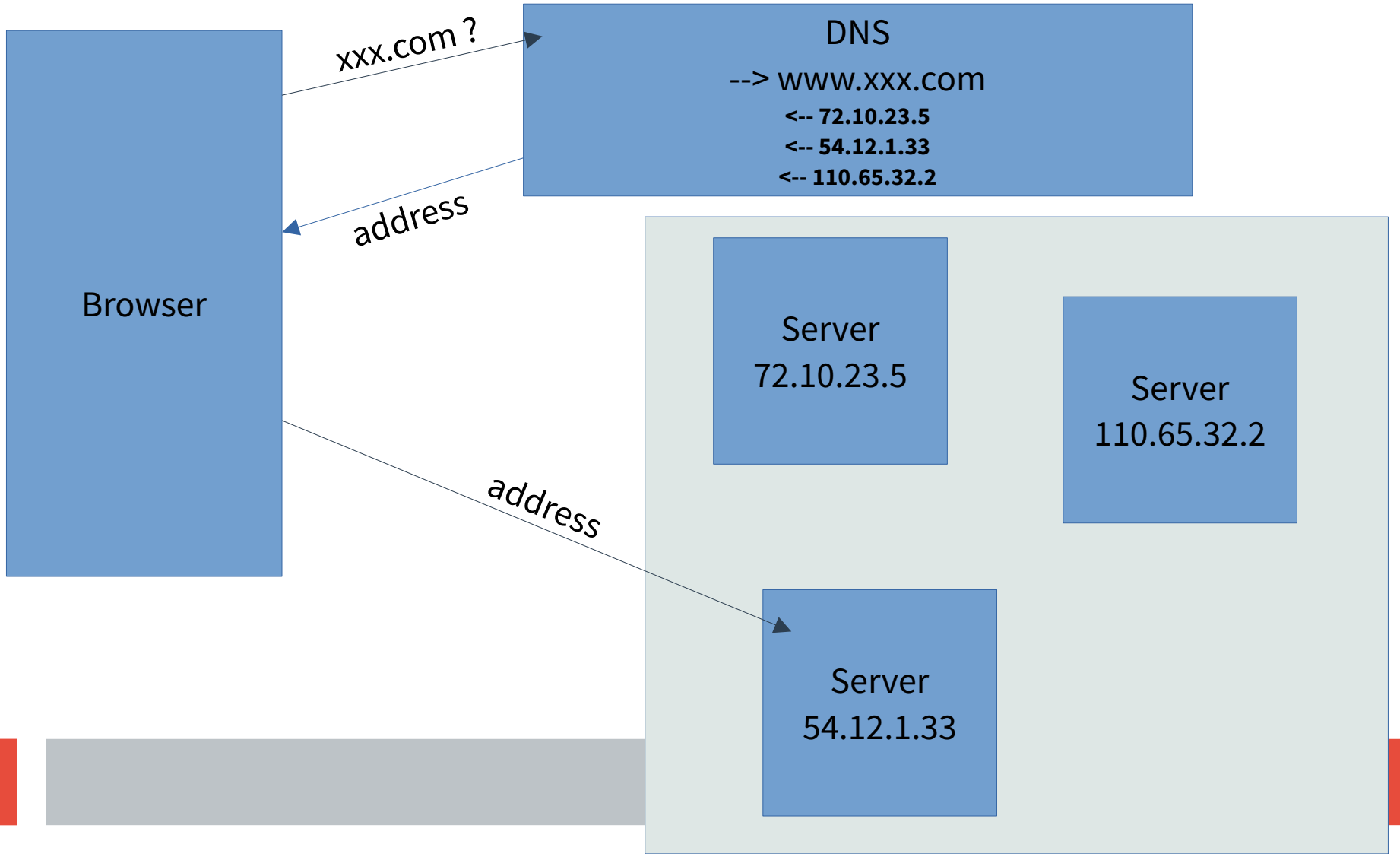
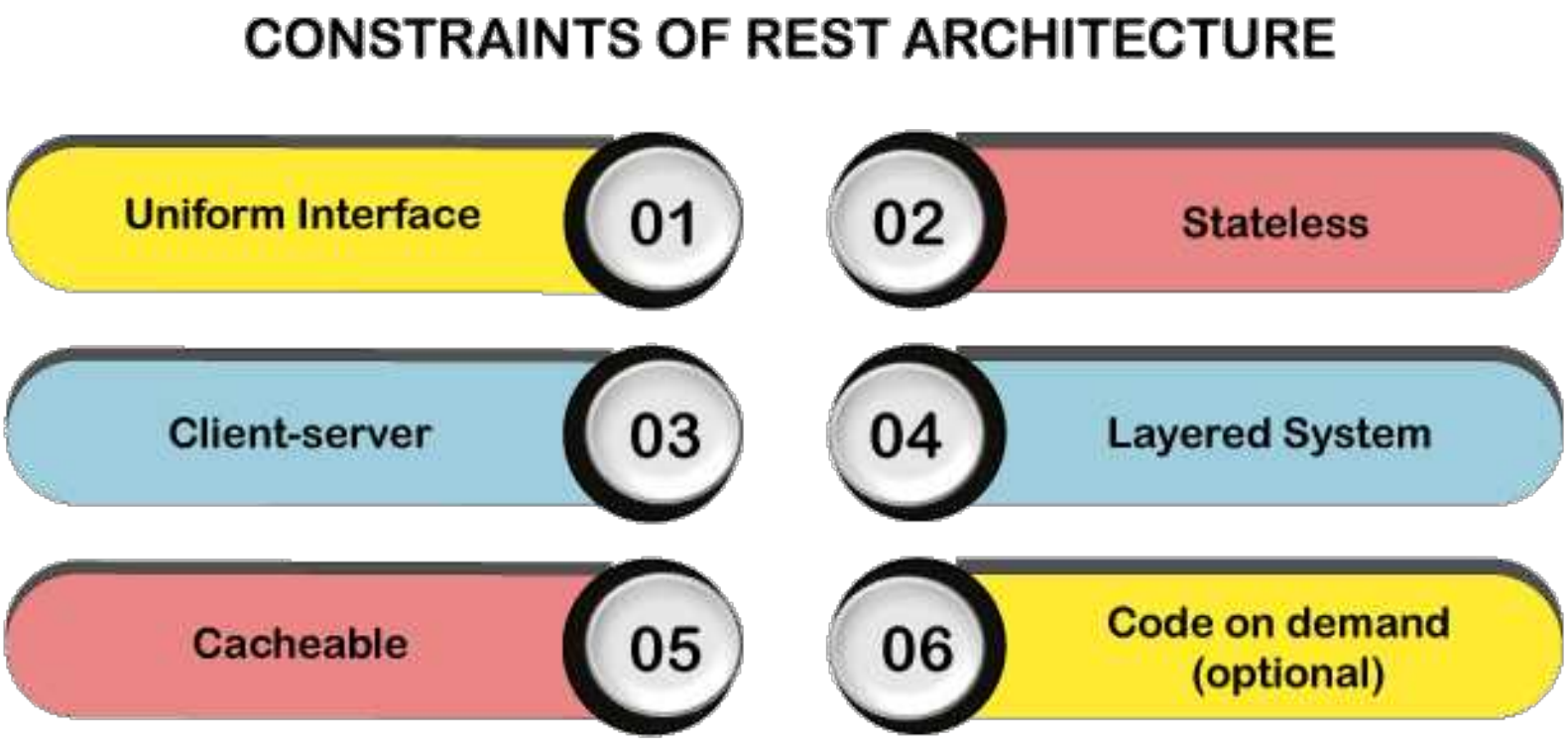


Figure 1. Web caches. REST In Practice, 2010.

DNS


Browser
xxx.com ?
address
DNS
--> www.xxx.com
<-- 72.10.23.5
<-- 54.12.1.33
<-- 110.65.32.2
address
Server
72.10.23.5
Server
110.65.32.2
Server
54.12.1.33

Constraint Stile Architetturale REST



BitBucket

Lista Commit di un repository

```
GET /rest/api/1.0/projects/{projectKey}/repos/{repoSlug}/commits
```

Lista commenti Pull Request filtrando quelli con action=="COMMENTED"

```
GET /rest/api/latest/projects/{project}/repos/{repo}/pull-requests/{prId}/
activities
```

Elencare permessi repository (cloud)

```
GET /repositories/{workspace}/{repo_slug}/permissions-config/users
```

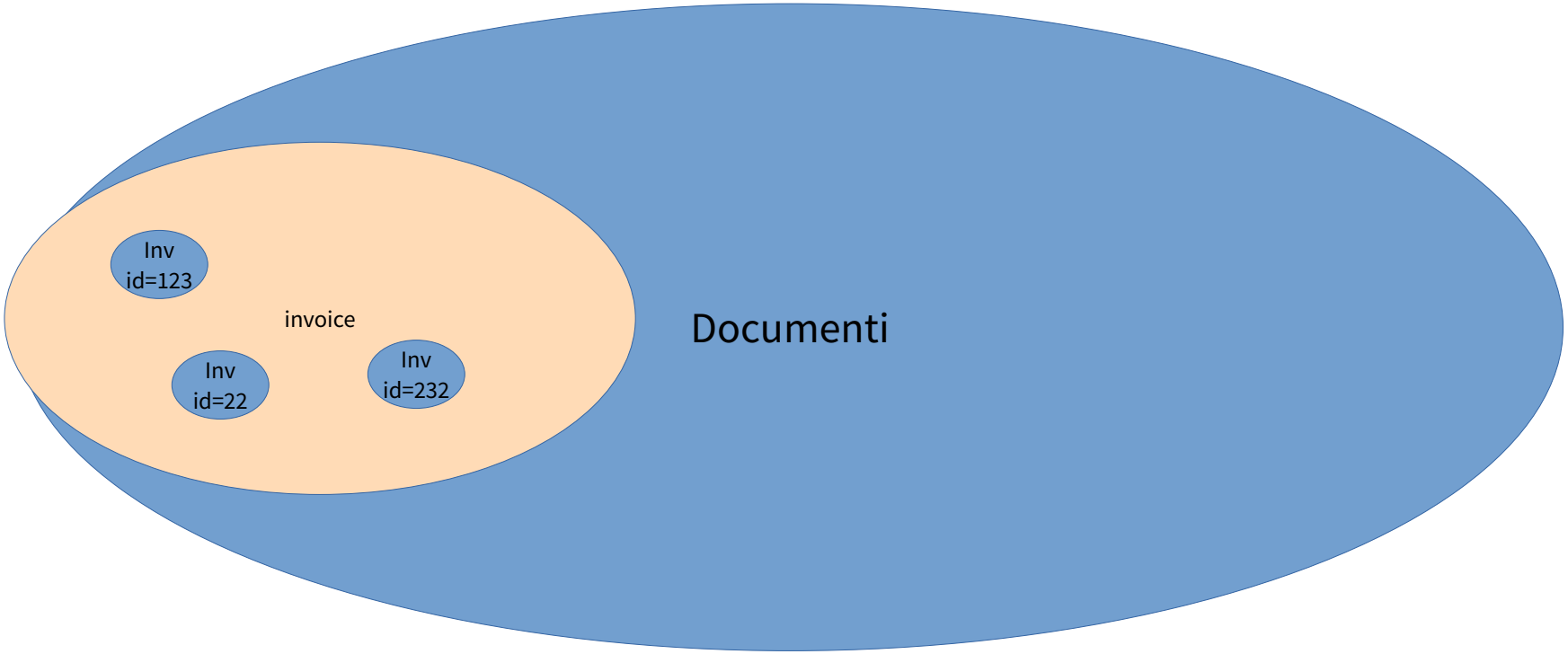
BitBucket

Lista Commit di un repository (ritorna un JSON)

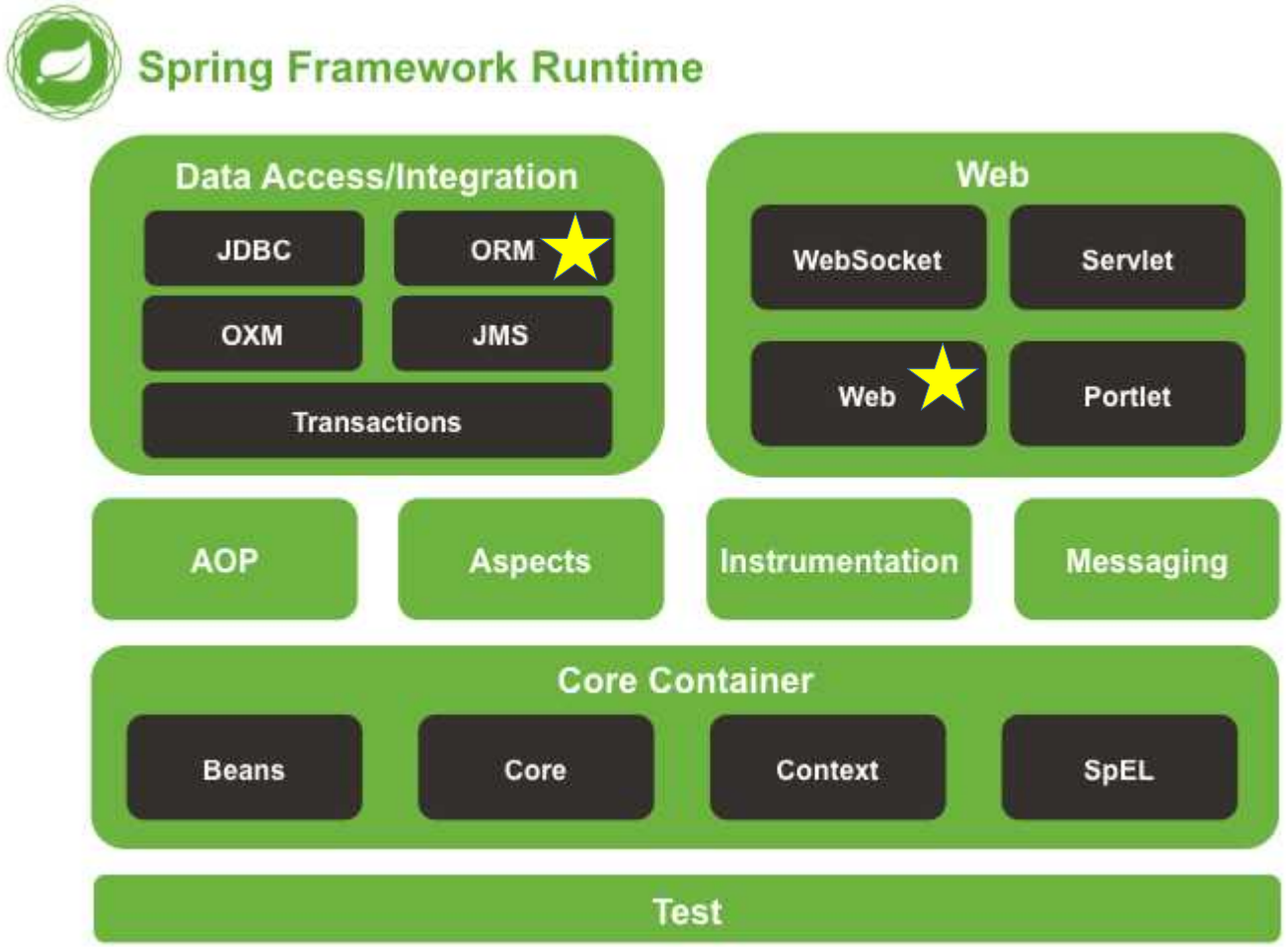
```
curl -u USER:PASS \
  "https://your-bitbucket-server/rest/api/1.0/projects/PROJ/repos/my-repo/commits?until=master"
```


```
{
  "size": 2,
  "limit": 25,
  "isLastPage": true,
  "values": [
    {
      "id": "01f9c86...",
      "displayId": "01f9c86",
      "author": { "name": "Alice", "emailAddress": "alice@example.com" },
      "message": "Fix bug XYZ",
      "parents": [ { "id": "abcdef123" } ]
    },
    { /* altro commit */ }
  ],
  "start": 0,
  "nextPageStart": 2
}
```

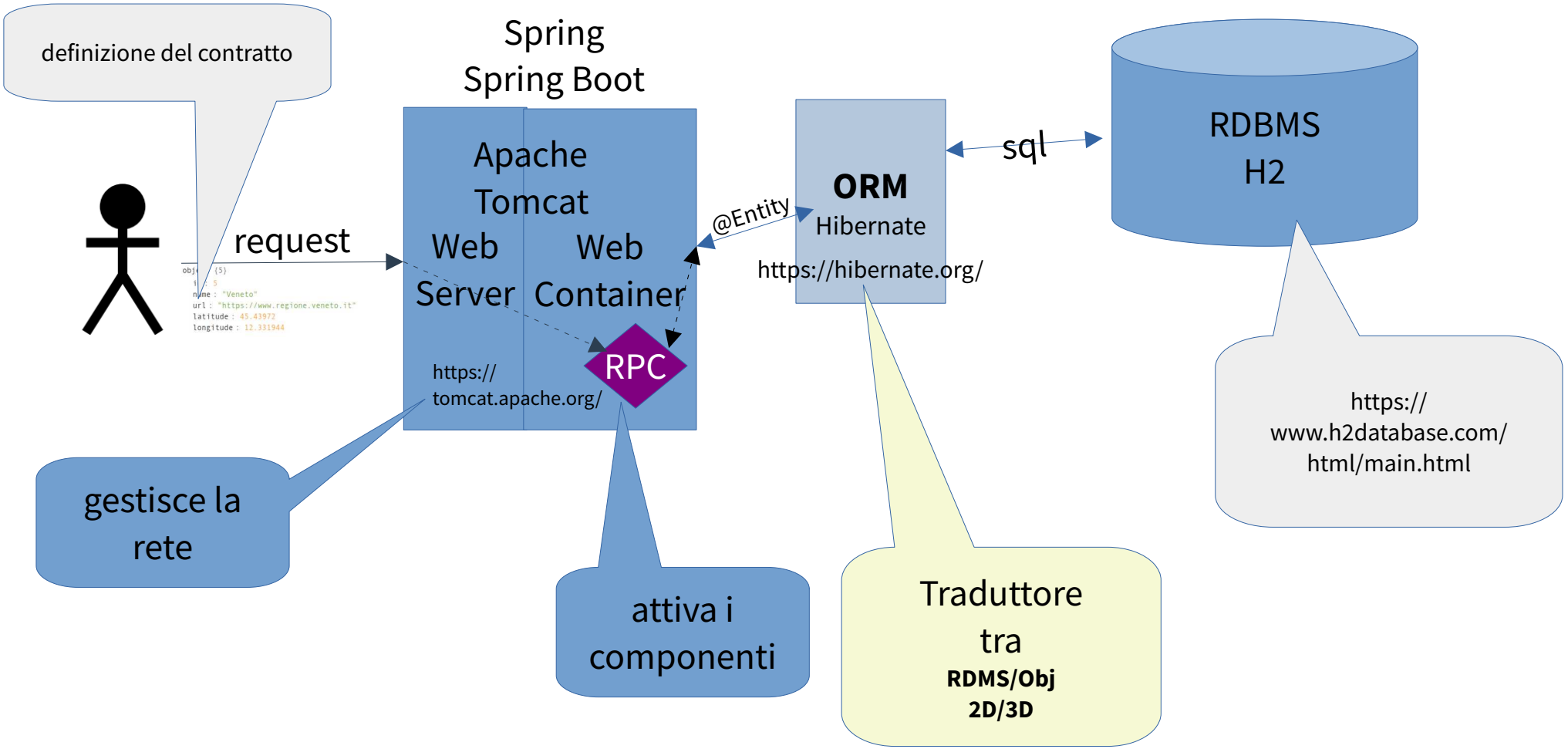
Classes o tipi & valori



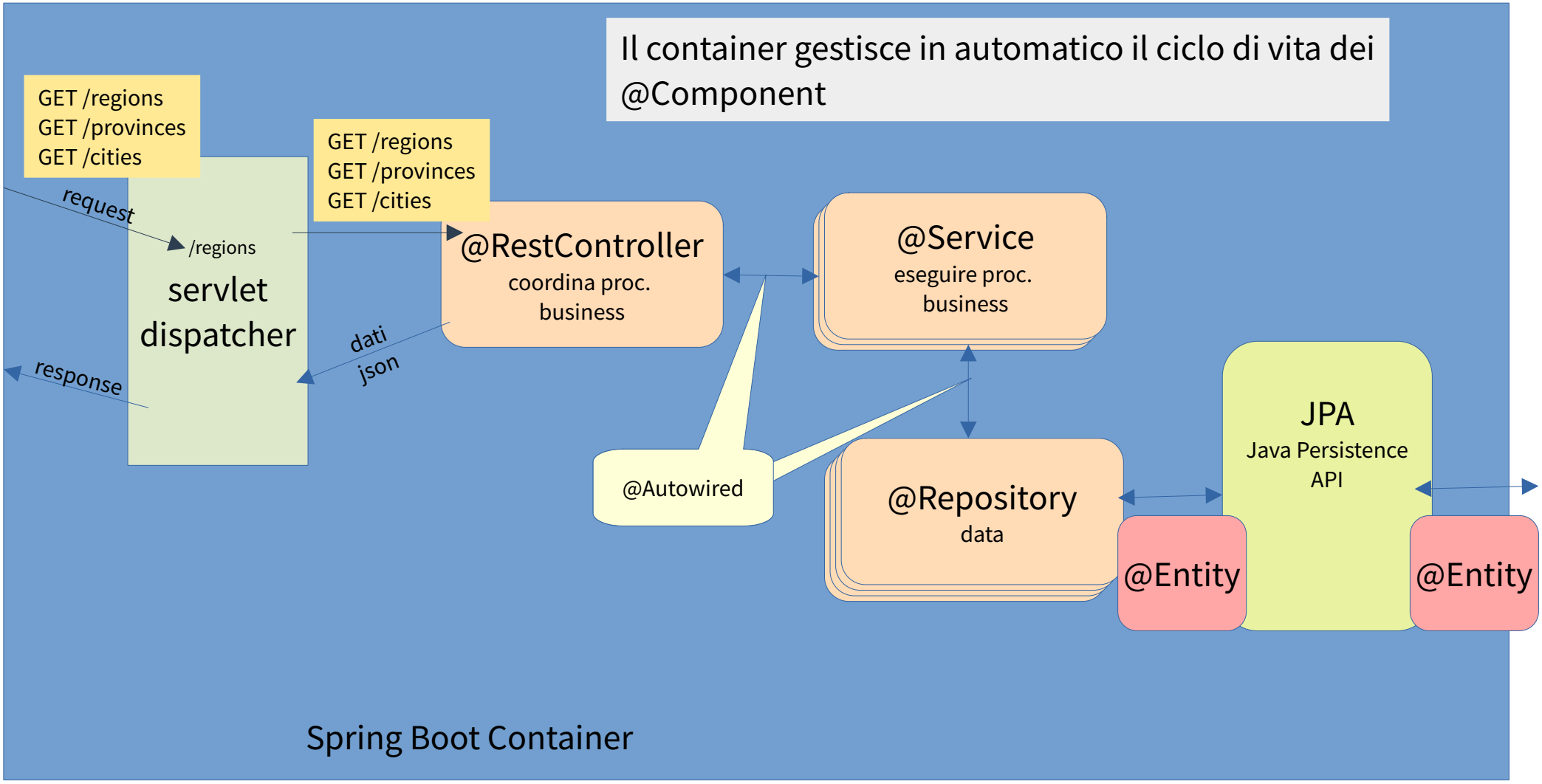
Server REST Backend Java+Spring(boot)



Spring Boot Application



Application in SpringBoot



RDBMS VS Objects

```
@Column(name = "codice_citta_metropolitana") // visione lato rdbms
```

```
private String codiceCittaMetropolitana; // visione lato OOP
```

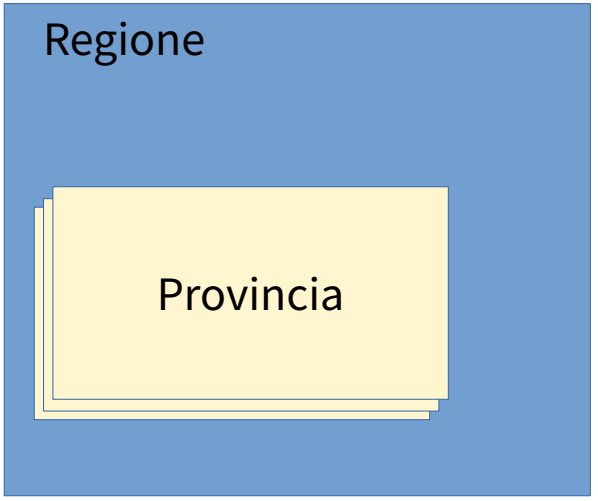
SELECT * FROM province;

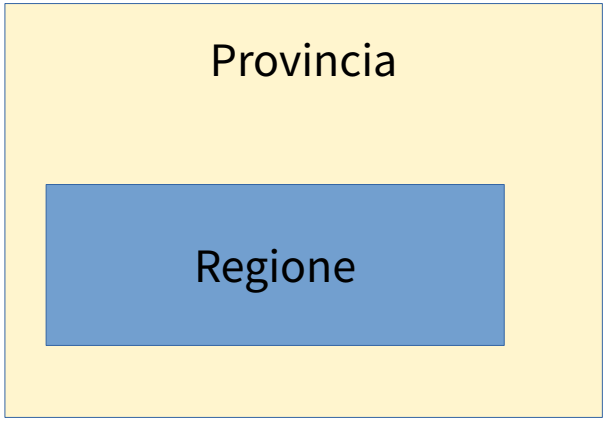
ID	ID_REGIONE	CODICE_CITTA_METROPOLITANA	NOME	SIGLA_AUTOMOBILISTICA	LATITUDINE	LONGITUDINE
1	1	201	Torino	TO	45.063299	7.669289
2	1	*null*	Vercelli	VC	45.320220	8.418508
3	1	*null*	Novara	NO	45.548513	8.515079
4	1	*null*	Cuneo	CN	44.597031	7.611422
5	1	*null*	Asti	AT	44.900765	8.206432
6	1	*null*	Alessandria	AL	44.817559	8.704663

SELECT * FROM REGIONI;

ID	NOME	URL	LATITUDINE	LONGITUDINE
1	Piemonte	https://www.regione.piemonte.it	45.066666	7.7
2	Valle d'Aosta/Vallée d'Aoste	https://www.regione.vda.it	45.73722	7.320556
3	Lombardia	https://www.regione.lombardia.it	45.46416	9.190336
4	Trentino-Alto Adige/Südtirol	https://www.regione.taa.it	46.066666	11.116667
5	Veneto	https://www.regione.veneto.it	45.43972	12.331944
6	Friuli Venezia Giulia	https://www.regione.fvg.it	45.636112	13.804167

2D





3D

Al boot dell'applicazioni

https://start.spring.io/

HTTP Methods

GET => `@GetMapping`

POST => `@PostMapping`

PUT => `@PutMapping`

DELETE => `@DeleteMapping`

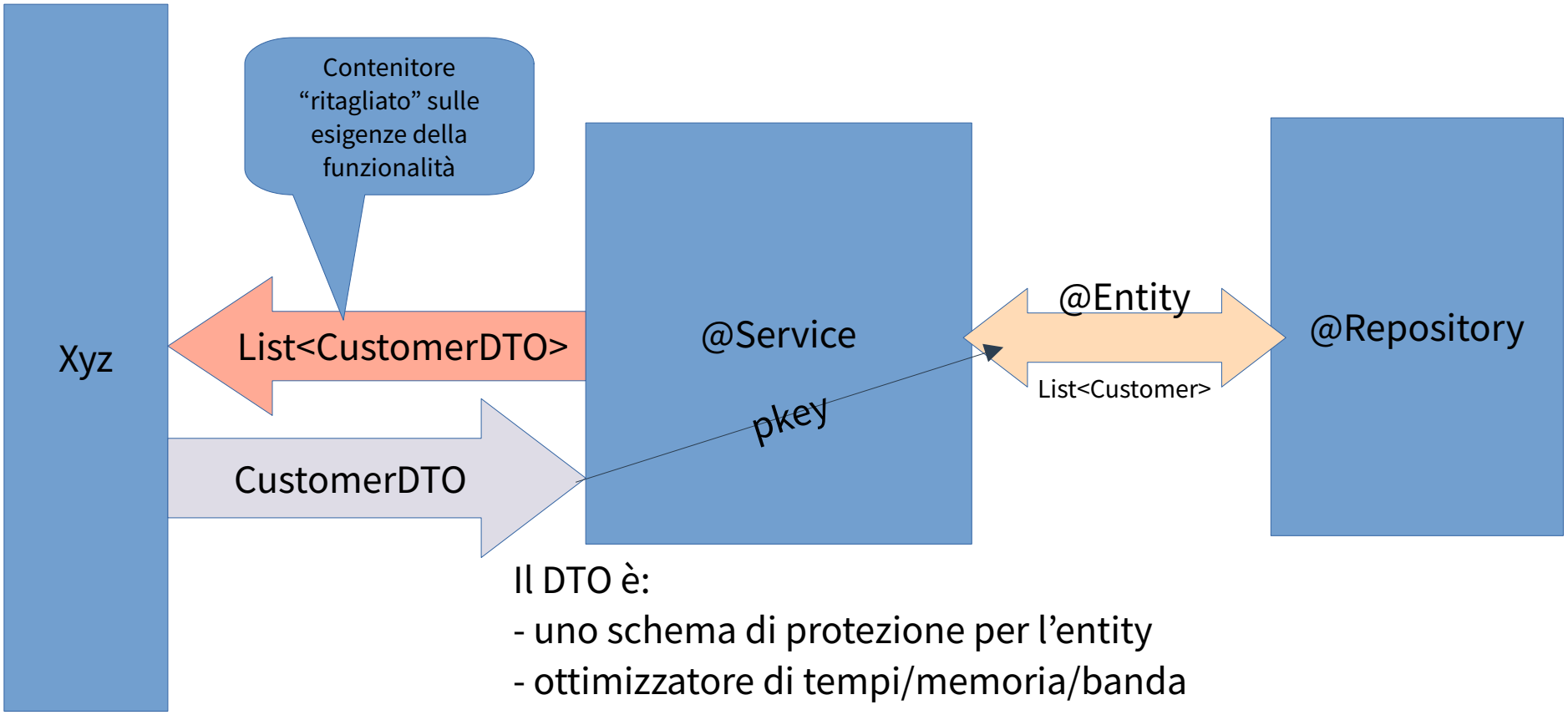
PATCH => `@PatchMapping`

1) match tra urlpath e RequestMapping
onMatch=>attiva
onNoMatch=>404

2) match tra Http Method e @XyzMapping
onMatch=>attiva
onNoMatch=>404

3) match tra Http Method Url e URL di @XyzMapping
onMatch=>attiva
onNoMatch=>404

DTO pattern (Data Transfer Object)



Il DTO è:
- uno schema di protezione per l'entity
- ottimizzatore di tempi/memoria/banda
- foundation per il JSON di scambio

Il DTO è associato ad un mapper che converte da e verso l'entity

News in V2

- new ApiError

- repo method findByNomeContainingIgnoreCase(String nome) di RegionRepository, ProvinceRepository, CityRepository (query added)

- RegionController, ProvinceController, CityController per aggiunta metodo di filtraggio e “query string”

```
@GetMapping
public List<CityDTO> getAllCities(
        @RequestParam(name = "regionId", required = false) Integer regionId,
        @RequestParam(name = "provinceId", required = false) Integer provinceId,
        @RequestParam(name = "name", required = false) String name) {
    return cityService.getCities(regionId, provinceId, name);
}
```

API: cosa serve? Lista della spesa.

- progettare la semantica (significato delle API), tenendo presente il linguaggio “funzionale” (DDD ubiquitus language), non il linguaggio del DB.
- Progettare il contratto: definire la struttura del JSON+DTO (o dell’XML) da usare nello “scambio dei dati”, ovvero l’interfaccia fornita dai servizi. [il DTO viene serializzato in JSON e deserializzato da JSON]
- Progettare il contratto relativo al messaging: definire la struttura del JSON (o dell’XML) da usare nella segnalazione degli errori (Possibilmente risolto dagli standard aziendali).