



# Geobeyond

Elastic Stack in A Day

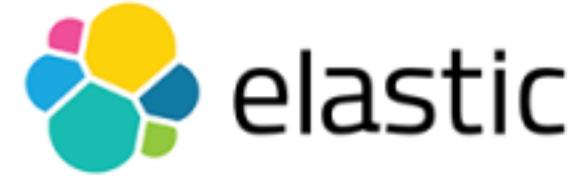
Milano – 16 Giugno 2016

*OpenGeo Suite e Elasticsearch*



## Agenda

- *COSA E' LA OPENGEO SUITE*
- *COMPONENTE SPATIAL DI ELASTICSEARCH*
- *ELASTICSEARCH COME BACKEND DI GEOSERVER*
- *DATA FUSION IN UN WEBGIS*
- *Q/A*

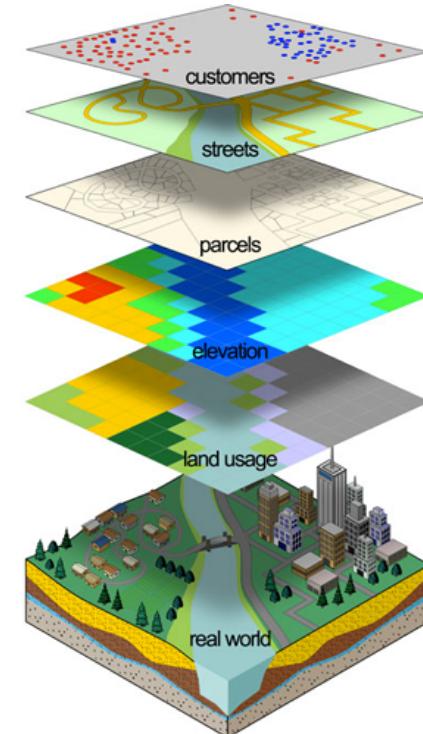


- **STARTUP INNOVATIVA** nata nel 2011
  - **SISTEMI INFORMATIVI GEOGRAFICI**
  - **SISTEMI DI IDENTITY & ACCESS MANAGEMENT**
- **PARTNER BOUNDLESS SPATIAL INC.**
- **SOCIO FONDATORE RIOS (Rete Italiana Open Source Professionale)**



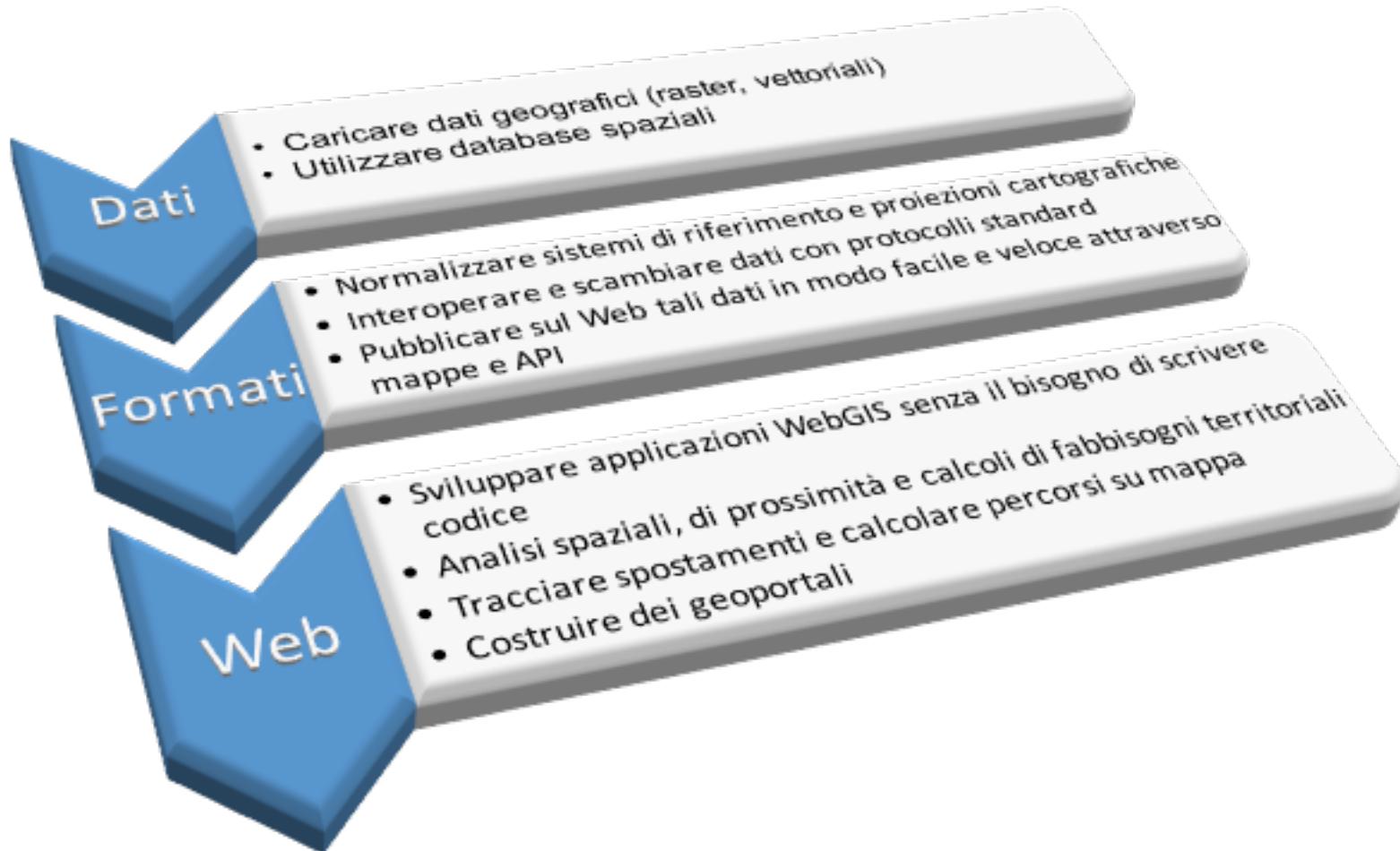
## INFORMAZIONE GEOGRAFICA

- *Gli asset aziendali/amministrativi sono fonte primaria di informazioni geografiche*
- *In media ≈80% delle informazioni residenti nei database sono correlate a dati con caratteristiche geografiche*
- *Trend di crescita esponenziale (Smart Cities, IoT, Big Data)*





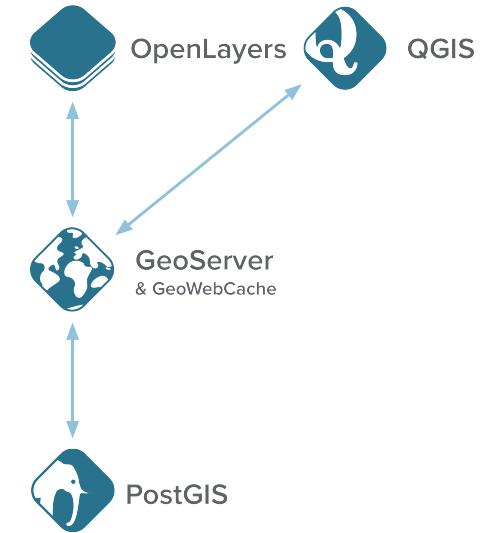
## Esigenze di business



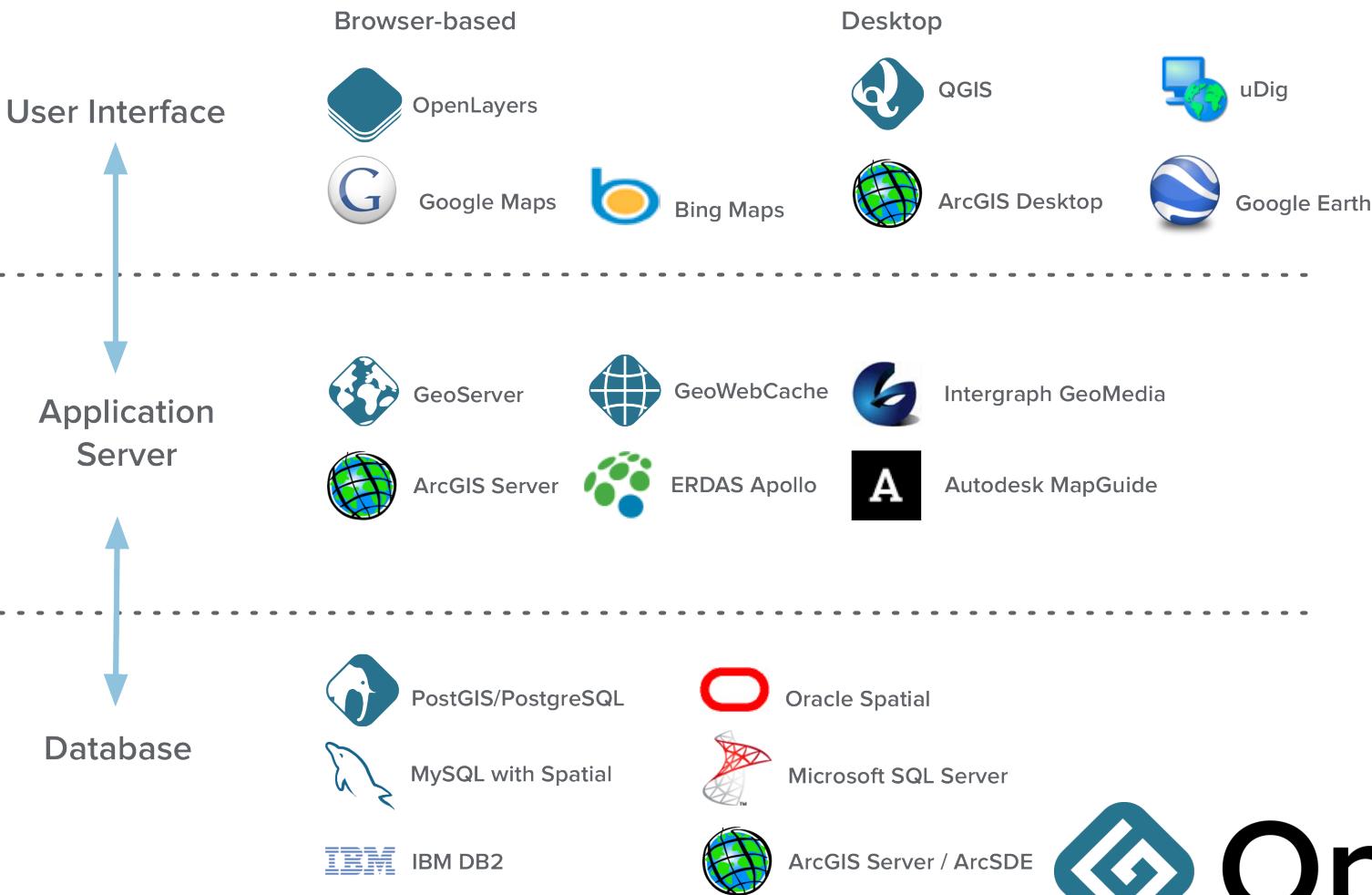


## OPENGEO SUITE

- *Ecosistema di componenti open source*
  - *GeoExt/OpenLayers*
  - *GeoWebCache*
  - *GeoServer*
  - *PostGIS*
  - *GeoGig*
  - *QGIS*

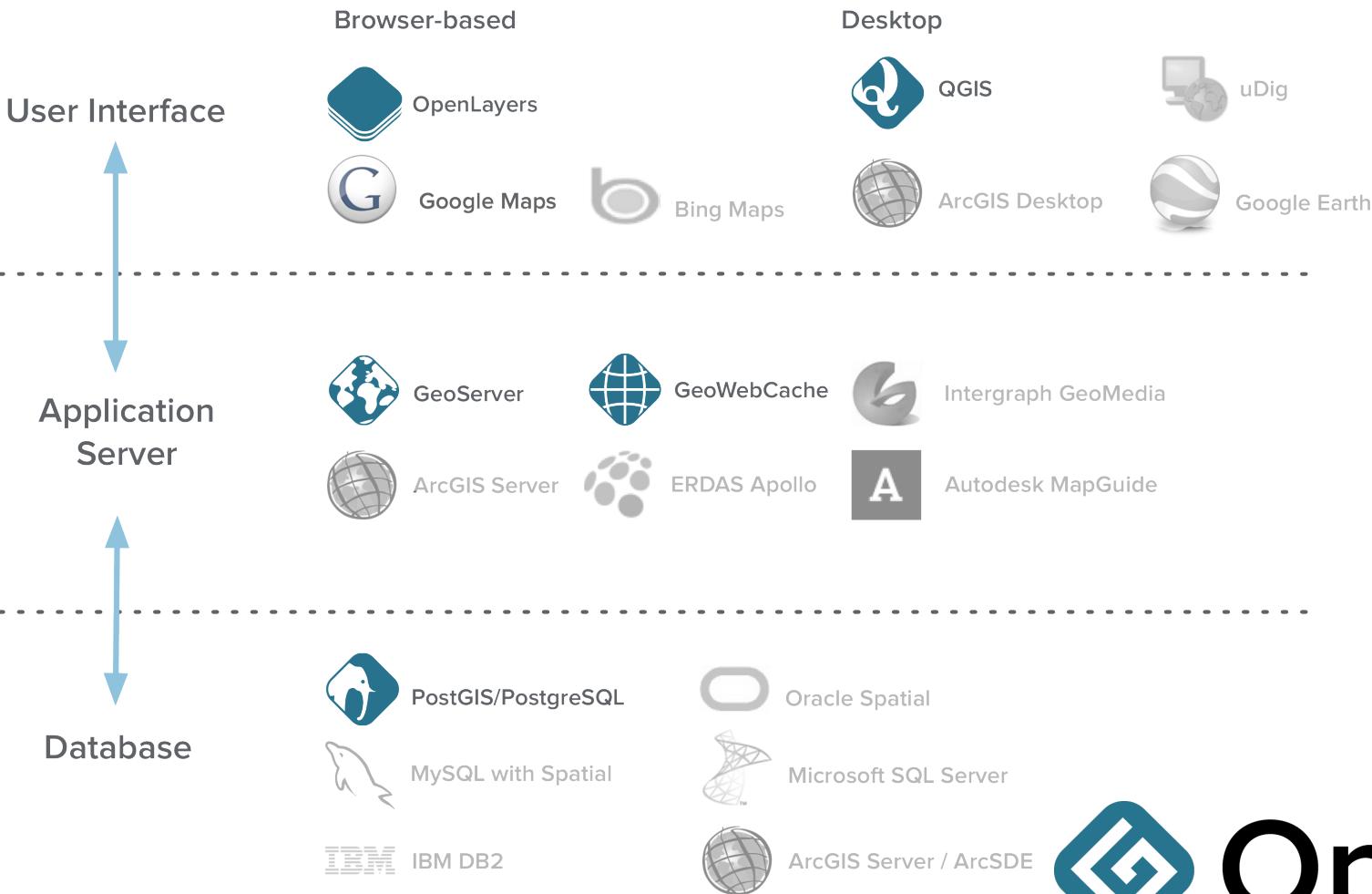
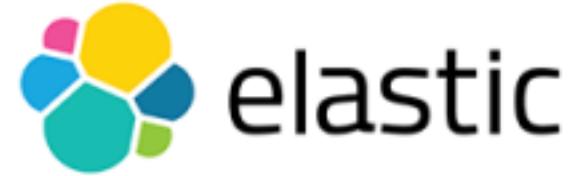


 **OpenGeo Suite**



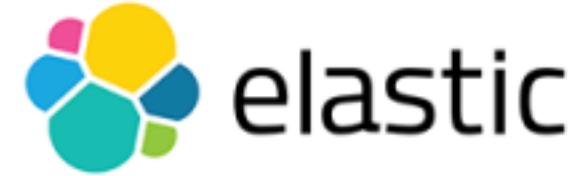
L'ALTERNATIVA OPEN

 OpenGeo Suite



L'ALTERNATIVA OPEN

 OpenGeo Suite



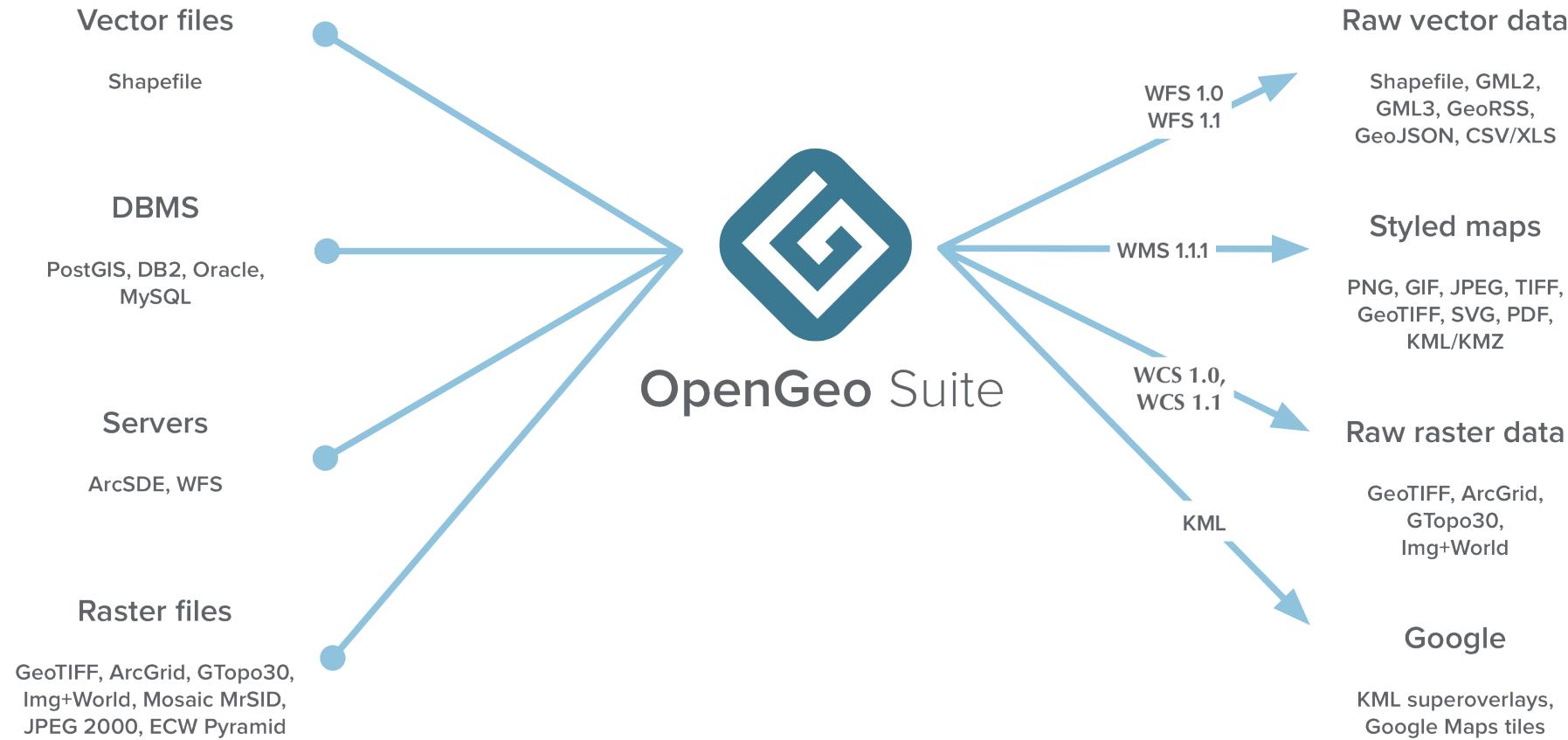
## CARATTERISTICHE

- *Soluzione GIS completa*
- *Versione Community e Enterprise (≠ supporto)*
- *Pronta all'uso e facile da usare*
- *Basata su servizi SOA e REST*
- *Aderente agli standard di settore OGC e INSPIRE*
- *Flessibile, modulare e interoperabile*
- *Integrata out-of-the-box con OpenStreetMap*
- *Integra connettori plug&play ad altri backend di terze parti*





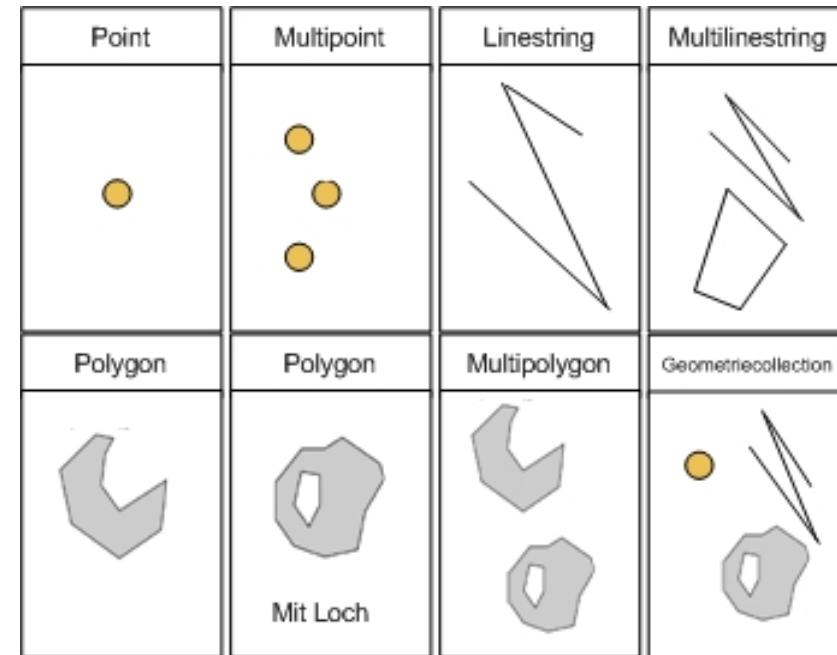
## ARCHITETTURA

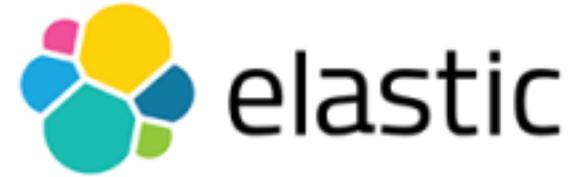


## ELASTICSEARCH

- *Componente Spaziale*

- *Tipi geometrici: geo\_point, geo\_shape*
- *Gli indici ES possono avere i due tipi geometrici*
- *Mappings:*
  - *geo\_point: le coordinate lat/lon espresse come stringa, array, oggetto key/value o geohash*
  - *geo\_shape: gli elementi geometrici sono creati secondo gli standard OGC e ISO*
    - *OGC Simple feature Access*
    - *ISO Geographic Information*





## Mappings GEO\_POINT

```
POST public/incidents
{
  "location" : { "lat" : 41.12, "lon" : -71.34 }
}

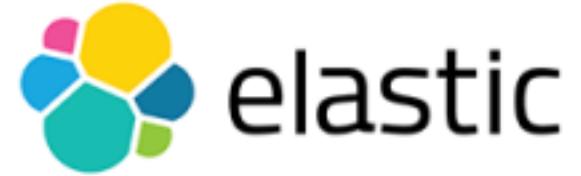
alternativamente

POST public/incidents
{
  "location" : "41.12, -71.34"
}

POST public/incidents
{
  "location" : [ [-71.34, 41.12], [ -71.34, 41.21] ]
}
```

## Mappings GEO\_SHAPE

```
PUT public/schools/
{
  "geometry" : {
    "type" : "polygon",
    "coordinates" : [
      [
        [40.7538588, -73.9762134], [40.7526327, -73.9742356],
        [40.7516774, -73.9656733], [40.7521246, -73.9763236],
        [40.7516733, -73.9723788], [40.7523556, -73.9732423],
        [40.7538588, -73.9762134]
      ]
    }
  }
}
```

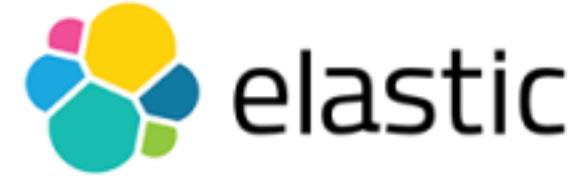


## Caricamento dati

- *Portale Open Data Milano*
  - *Shapefiles dei trasporti: <http://dati.comune.milano.it/>*
  - *Attenzione con il sistema di riferimento!!!*
- *GDAL rescue!!!*
  - *Conversione al volo e caricamento con il driver ELASTICSEARCH*

```
$ ogr2ogr -progress -lco INDEX_NAME=elasticday -lco MAPPING_NAME=mfermate  
-lco FID=ID -lco GEOMETRY_NAME=geometry -lco  
GEOM_MAPPING_TYPE=GEO_POINT -s_srs EPSG:32632 -t_srs EPSG:4326 -f  
"ElasticSearch" http://localhost:9200 MM_FERM.shp
```





## GEO SERVER PLUGIN

- *Connettore Elasticsearch ELASTICGEO*
  - *Datastore di GeoServer*
  - *Un indice ES è pubblicato come layer di GeoServer*
  - *Supporta i mappings dei tipi **geo\_point** e **geo\_shape***
  - *I filtri OGC sono convertiti in filtri ES nelle chiamate WMS e WFS*
  - *Compatibilità:*
    - *Java SDK (>=1.7)*
    - *GeoServer 2.7.x+ e Elasticsearch 1.4.x+*



**GeoServer**



- *Build del plugin:*

```
$ git clone https://github.com/geobeyond/elasticgeo.git
```

```
$ git checkout 2.8-SNAPSHOT
```

```
$ mvn clean install
```

```
$ cd gs-web-elasticsearch && mvn package -P deploy
```

- *Installazione:*

```
$ cp target/elasticgeo2.8-SNAPSHOT-gs2.8-SNAPSHOT-es2.2.2.jar webapps/geoserver/WEB-INF/lib
```

```
$ cp guava-18.0.jar webapps/geoserver/WEB-INF/lib
```

## INSTALLAZIONE

- *Necessario:*

- *Connettore ES*

- *Libreria Guava 1.8*



## DATABASE

[Get Started ↗](#)

PostGIS provides spatial objects for the PostgreSQL object-relational database, allowing efficient storage, query, and analysis of location information.

## SERVER

[Admin](#) [Get Started ↗](#)

GeoServer is a powerful map and feature server for sharing, analyzing, and editing geospatial data from any major spatial data source using open standards.

## DESKTOP

[Docs](#)

Use *OpenGeo Suite Explorer* for QGIS to publish data directly to OpenGeo Suite. Upload QGIS projects to GeoServer and PostGIS.

## WEB MAP LIBRARY

[Docs](#)

## WEB APP BUILDKIT

[Demo](#)[Get Started ↗](#)

## WEB MAP CLIENT

[Demo](#)[Docs](#)

## AVVIO OPENGEO SUITE

- <http://localhost:8080/dashboard>
- *DASHBOARD per l'accesso ai componenti*



GeoServer for OpenGeo Suite Enterprise

Logged in as admin. [Logout](#)

## Welcome

Welcome

This GeoServer belongs to [Boundless](#).

**2 Layers** [Add layers](#)

**2 Stores** [Add stores](#)

**3 Workspaces** [Create workspaces](#)

**Service Capabilities**

**WCS**

- 1.0.0
- 1.1.0
- 1.1.1
- 1.1
- 2.0.1

**WFS**

- 1.0.0
- 1.1.0
- 2.0.0

**WMS**

- 1.1.1
- 1.3.0

**TMS**

- 1.0.0

**WMS-C**

- 1.1.1

**WMPS**

- 1.0.0

**WPS**

**Feedback**

Please read the file /Users/geobart/Library/Application Support/GeoServer/data\_dir/security/masterpw.info and remove it afterwards. This file is a **security risk**.

Please remove the file /Users/geobart/Library/Application Support/GeoServer/data\_dir/security/users.properties.old because it contains user passwords in plain text. This file is a **security risk**.

The default user/group service should use digest password encoding.

The administrator password for this server has not been changed from the default. It is **highly recommended** that you change it now. [Change it](#)

No strong cryptography available, installation of the unrestricted policy jar files is recommended

This GeoServer instance is running version **2.8-SNAPSHOT**. For more information please contact the [administrator](#).

## AVVIO OPENGEO SUITE

- **<http://localhost:8080/geoserver>**
- ***Autenticazione:  
admin/geoserver***
- ***Console di  
amministrazione  
GEOSERVER***



## ELASTICGEO DATASTORE

### New data source

Choose the type of data source you wish to configure

#### Vector Data Sources

Directory of spatial files (shapefiles) - Takes a directory of shapefiles and e

Elasticsearch - Elasticsearch Index

H2 - H2 Embedded Database

PostGIS - PostGIS Database

### New Vector Data Source

Add a new vector data source

Elasticsearch  
Elasticsearch Index

#### Basic Store Info

Workspace \*

test

Data Source Name \*

status\_s

Description

Enabled

#### Connection Parameters

elasticsearch\_host

localhost

elasticsearch\_port

9300

index\_name \*

status\_s

search\_indices

status\_s\*

cluster\_name

elasticsearch

use\_local\_node

store\_data

scroll\_enabled

scroll\_size

20

scroll\_time

120

Save

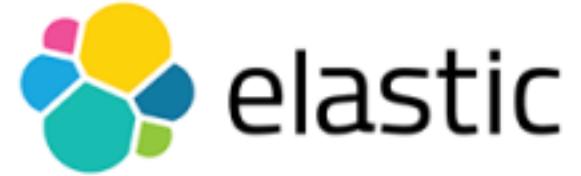
Cancel

#### Elasticsearch fields configuration

Use all  Short names

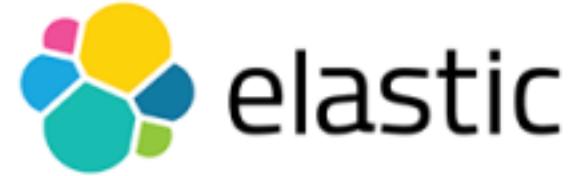
Use	Name	Type	Default Geometry	Stored	Analyzed	SRID	Date Format
<input checked="" type="checkbox"/>	status_s	String					
<input checked="" type="checkbox"/>	id	String					
<input checked="" type="checkbox"/>	security_ss	String				x	
<input checked="" type="checkbox"/>	standard_ss	String					
<input checked="" type="checkbox"/>	speed_is	Integer				x	
<input checked="" type="checkbox"/>	geo*	Point		<input checked="" type="checkbox"/>		x	4326
<input type="checkbox"/>	geo3*	Geometry		<input type="checkbox"/>			4326
<input checked="" type="checkbox"/>	modem_b	Boolean				x	
<input checked="" type="checkbox"/>	geo2*	Geometry		<input type="checkbox"/>			4326
<input type="checkbox"/>	installed_tdt	Date					dateOptionalTime
<input type="checkbox"/>	vendor_s	String					

Apply



## RICHIESTE WMS/WFS

- *Personalizzazione con i parametri “q” e “f”*
  - *OPERATORI SPAZIALI*
    - *geo\_shape: BBOX, Intersect, Within, Disjoint*
    - *geo\_point: BBOX, Within, DWithin, Beyond distance buffer*
  - *GeoServer SQL Views (viewparams)*
  - *Supporto filtri BBOX, CQL o OGC*



## RICHIESTE WMS/WFS FILTRO BBOX e CQL

[http://localhost:8080/geoserver/elasticday/wms?service=WMS&version=1.1.0&request=GetMap&layers=elasticday:park\\_pub\\_4326&styles=&bbox=-1,-1,10,10&width=279&height=512&srs=EPSG:4326&format=application/openlayers&cql\\_filter=indirizzo='Piazza Giulio Cesare'](http://localhost:8080/geoserver/elasticday/wms?service=WMS&version=1.1.0&request=GetMap&layers=elasticday:park_pub_4326&styles=&bbox=-1,-1,10,10&width=279&height=512&srs=EPSG:4326&format=application/openlayers&cql_filter=indirizzo='Piazza Giulio Cesare')

**UNA MAPPA DI UN TIPO DI DATO NELL'INDICE ELASTICSEARCH!!!**



## RICHIESTE WMS/WFS FILTRO BBOX e NATIVO

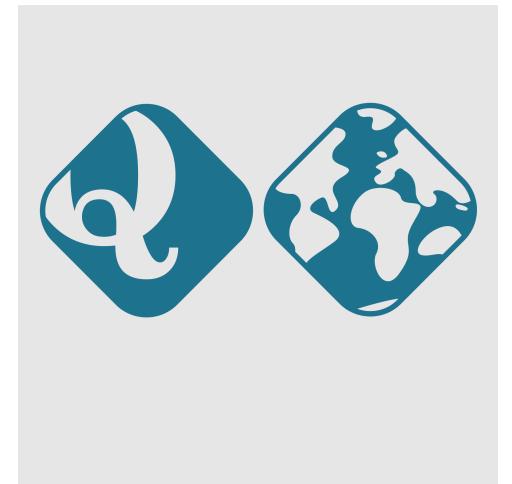
[http://localhost:8080/geoserver/elasticday/wms?service=WMS&version=1.1.0&request=GetMap&layers=elasticday:park\\_pub\\_4326&styles=&bbox=-1,-1,10,10&width=279&height=512&srs=EPSG:4326&format=application/openlayers&maxFeatures=1000&viewparams=f:{"term": {"indirizzo": "Piazza Giulio Cesare"} }](http://localhost:8080/geoserver/elasticday/wms?service=WMS&version=1.1.0&request=GetMap&layers=elasticday:park_pub_4326&styles=&bbox=-1,-1,10,10&width=279&height=512&srs=EPSG:4326&format=application/openlayers&maxFeatures=1000&viewparams=f:{)

**UNA MAPPA DI UN PARCO AD UN INDIRIZZO NELL'INDICE ELASTICSEARCH!!!**



## UN WEBGIS ALLORA?

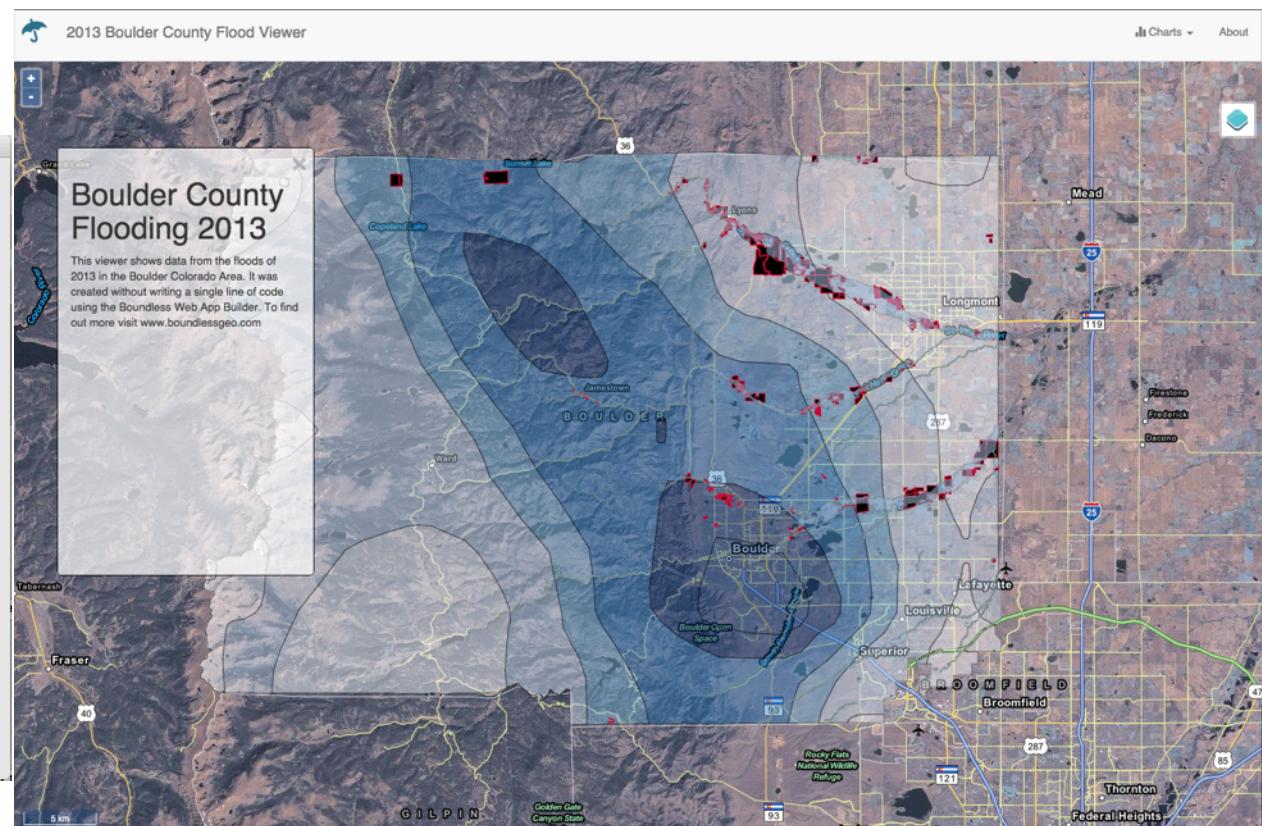
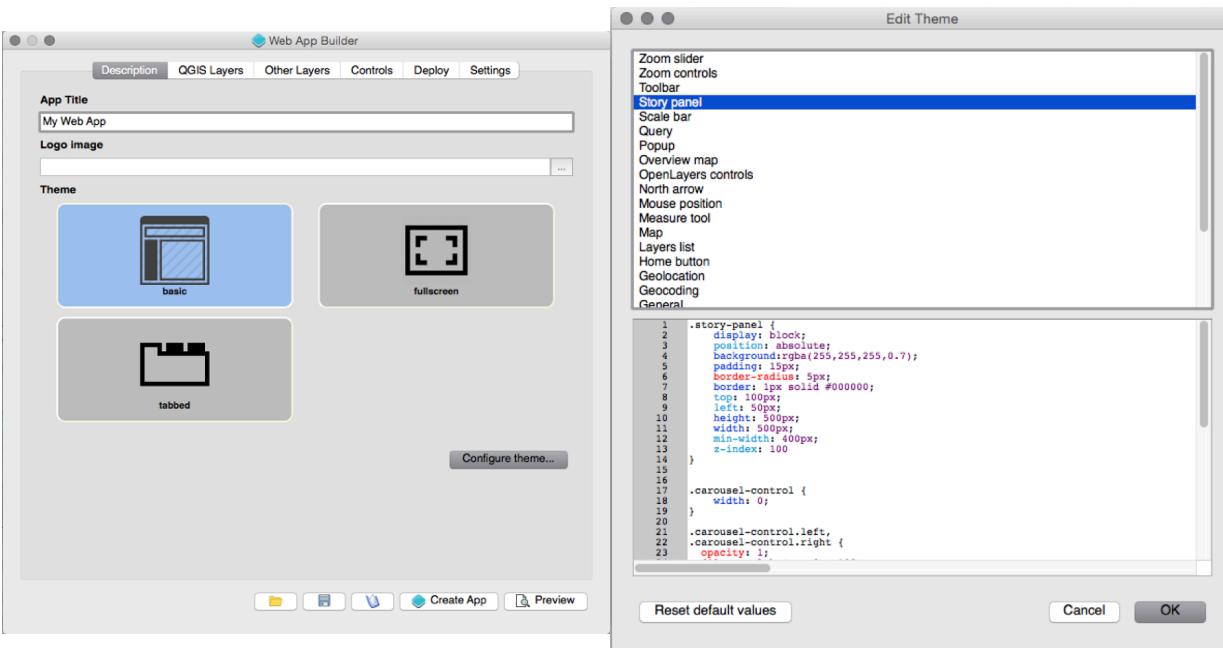
- **HTML? JAVASCRIPT? NODEJS? PYTHON? JAVA??**
- **QGIS INVECE!!!**
  - **BOUNDLESS PLUGINS**
    - **GEOERVER EXPLORER**
      - *Utility di configurazione di workspace, layer e stili nel catalogo di GeoServer*
    - **WEB APP BUILDER**
      - *Costruttore automatico di applicazioni WebGis basate su OpenLayers 3 a partire dai layer caricati dal catalogo di GeoServer*





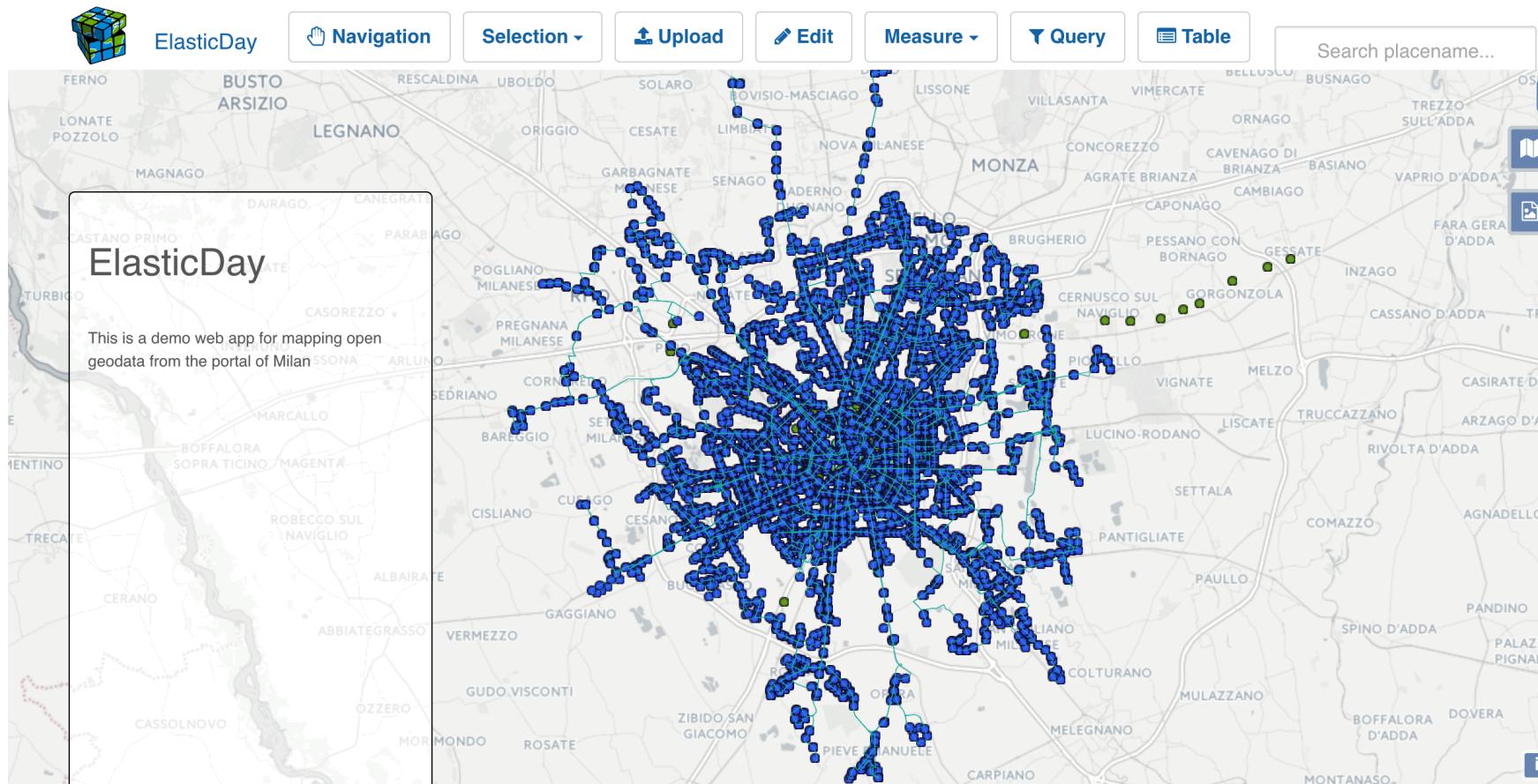
## Link utili:

- <http://boundlessgeo.com/2015/07/building-openlayers-3-web-app-without-writing-code-part-ii/>
- <http://suite.opengeo.org/opengeo-docs/qgis/index.html>
- <http://qgis.boundlessgeo.com/>





Live demo: <http://ogsuite.geobeyond.it/elasticday/index.html>



## ELASTICDAY APP



# GRAZIE



## Geobeyond

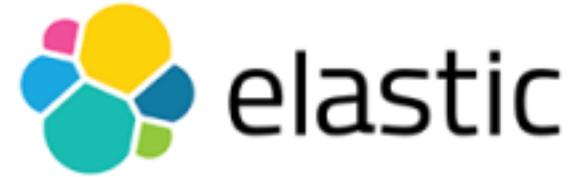
Making geospatial happen

Francesco Bartoli

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<https://www.linkedin.com/company/geobeyond>

[info@geobeyond.it](mailto:info@geobeyond.it)



# Q&A