



# **Vector Tiles, The new map service technique**

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# Agenda

- **Introduction**
- **TMS Map Service**
- **Vector Tiles vs Raster Tiles**
- **System Environment Preparation**
- **Data Preparation**

- **Vector Tiles Processing**
- **Vector Tiles Hosting**
- **Vector Tiles Styling**



# Introduction

**Vector Tile** เป็นเทคโนโลยีที่เรานำมาให้บริการแผนที่ผ่าน

Website ด้วยมาตรฐาน Tile Map Service (TMS) ซึ่งเป็น

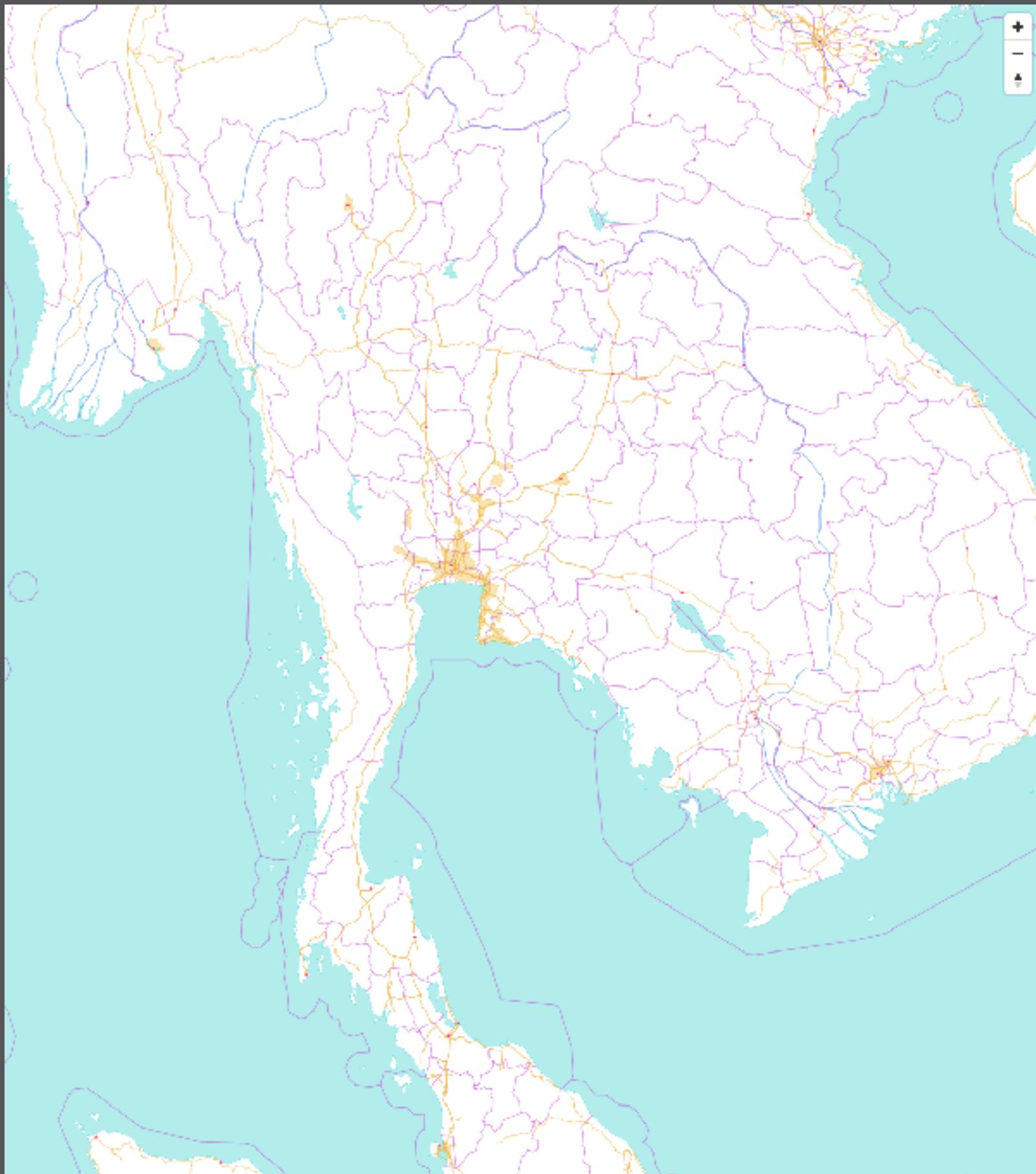
จะเป็นเทคโนโลยีที่จะมาแทนการให้บริการแบบ Raster Tile

เช่น มาตรฐาน WMS เพราะเราสามารถให้บริการข้อมูล

Vector ที่มีรายละเอียดสูงๆ ได้อย่างรวดเร็ว อีกทั้งเราไม่

ต้องกังวลเรื่องการให้ Styleing เนื่องจาก VectorTile

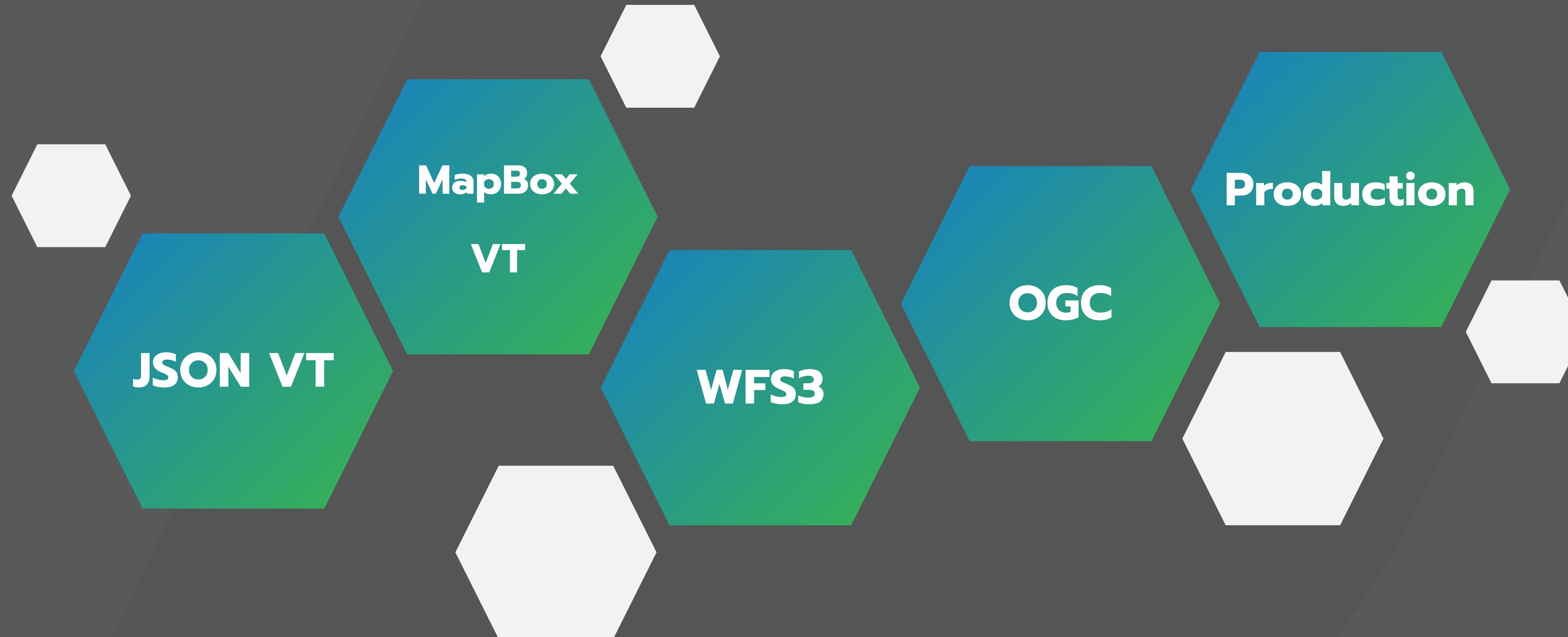
สามารถให้ Style ได้ที่ Frontend โดย JsonStyle





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# Vector Tile Road Maps





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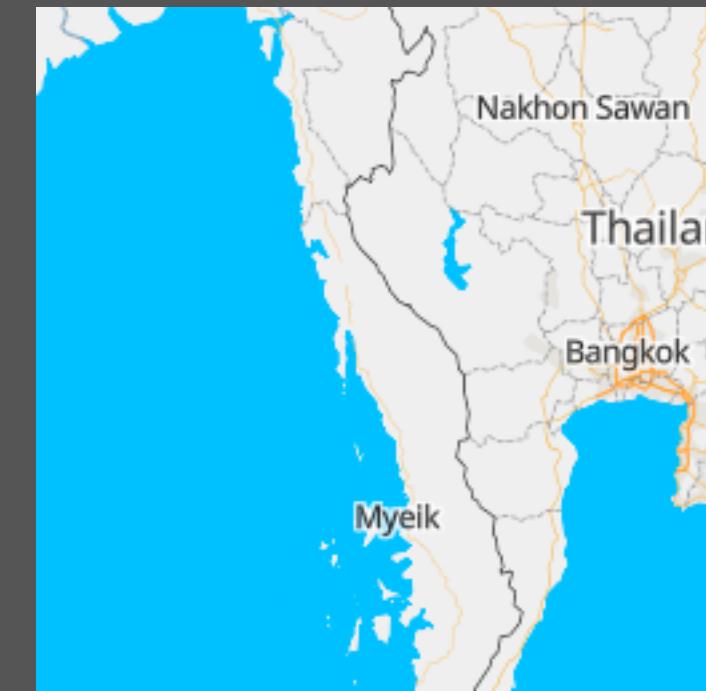
# TMS Map Service

**TMS Map Service (TMS)** เป็นรูปแบบการให้บริการแผนที่ผ่าน internet ที่มีมี

ลักษณะคล้ายคลึงกับ บริการแบบ WMS และการเรียกใช้ข้อมูล จะมีการเรียกในรูปแบบ

Tile ที่มีค่าเฉพาะเจาะจง ในแต่ละชั้น โดยตัวแปรการการเรียกใช้งานอยู่ในรูปแบบ Z X Y

ตัวอย่าง : <https://tile.i-bitz.co.th/styles/vallaris/6/49/29.png>



# Map Service Performance

## Evolution of web maps for performance

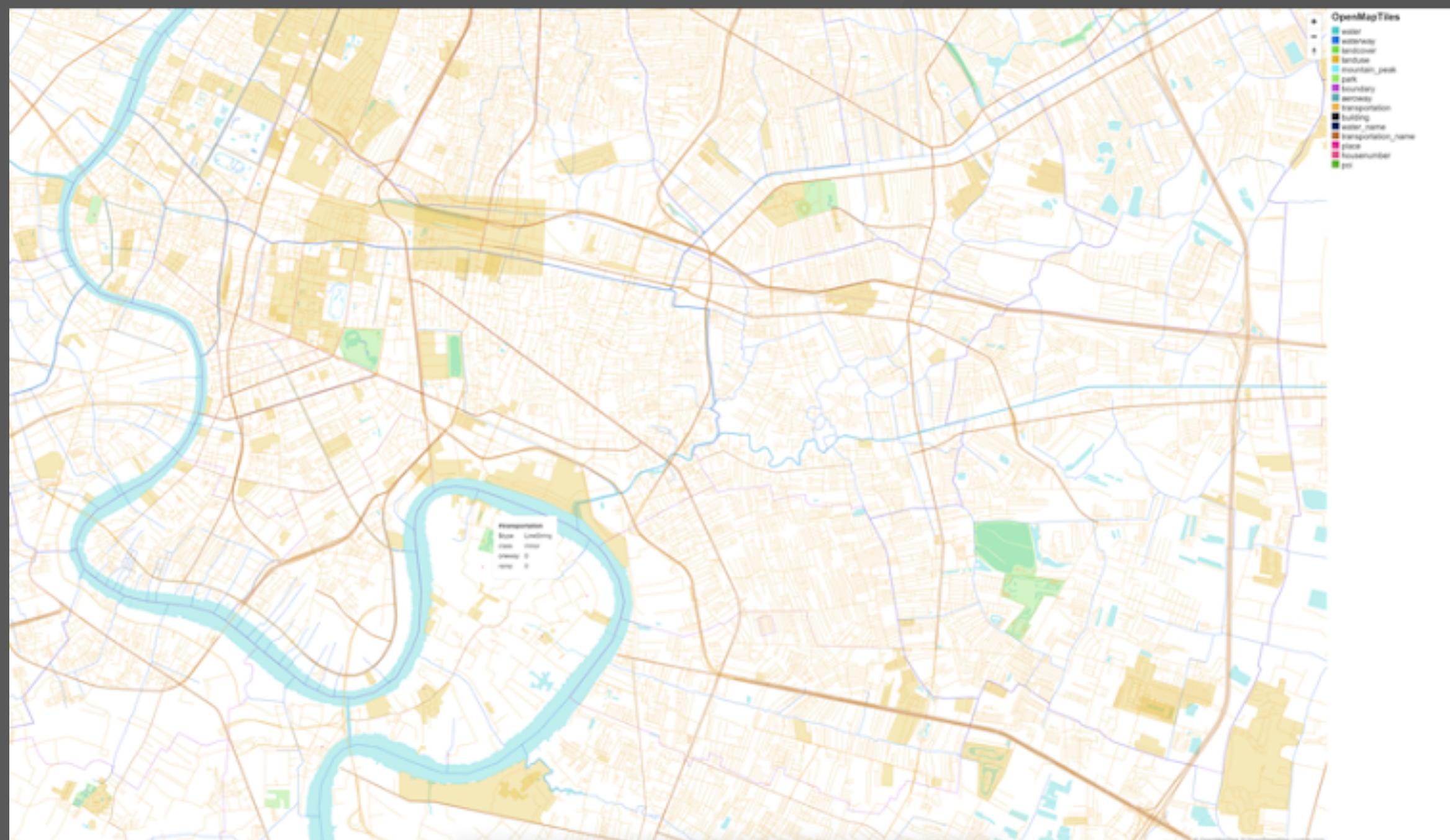
1	Untiled WMS	Selection by BBOX
2	Image tiles	Predictable & cached
3	Tiles and overlays	Vector retrofit
4	Vector tiles	Everything in vector

Reference: <https://tmcw.github.io/presentations/jsgeo>

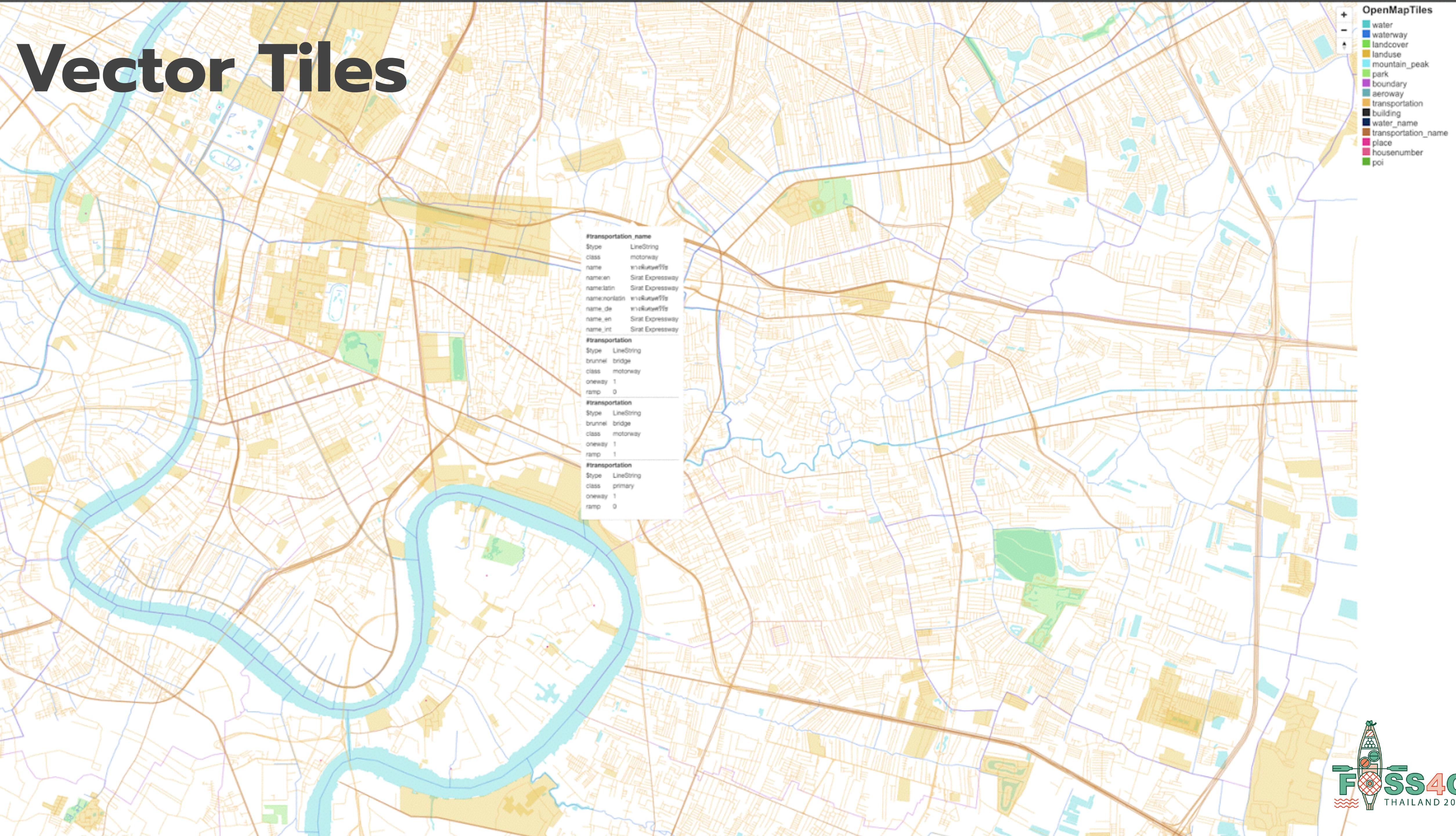


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# Vector Tiles vs Raster Tiles



# Vector Tiles





# Raster Tiles

# System Environment Preparation

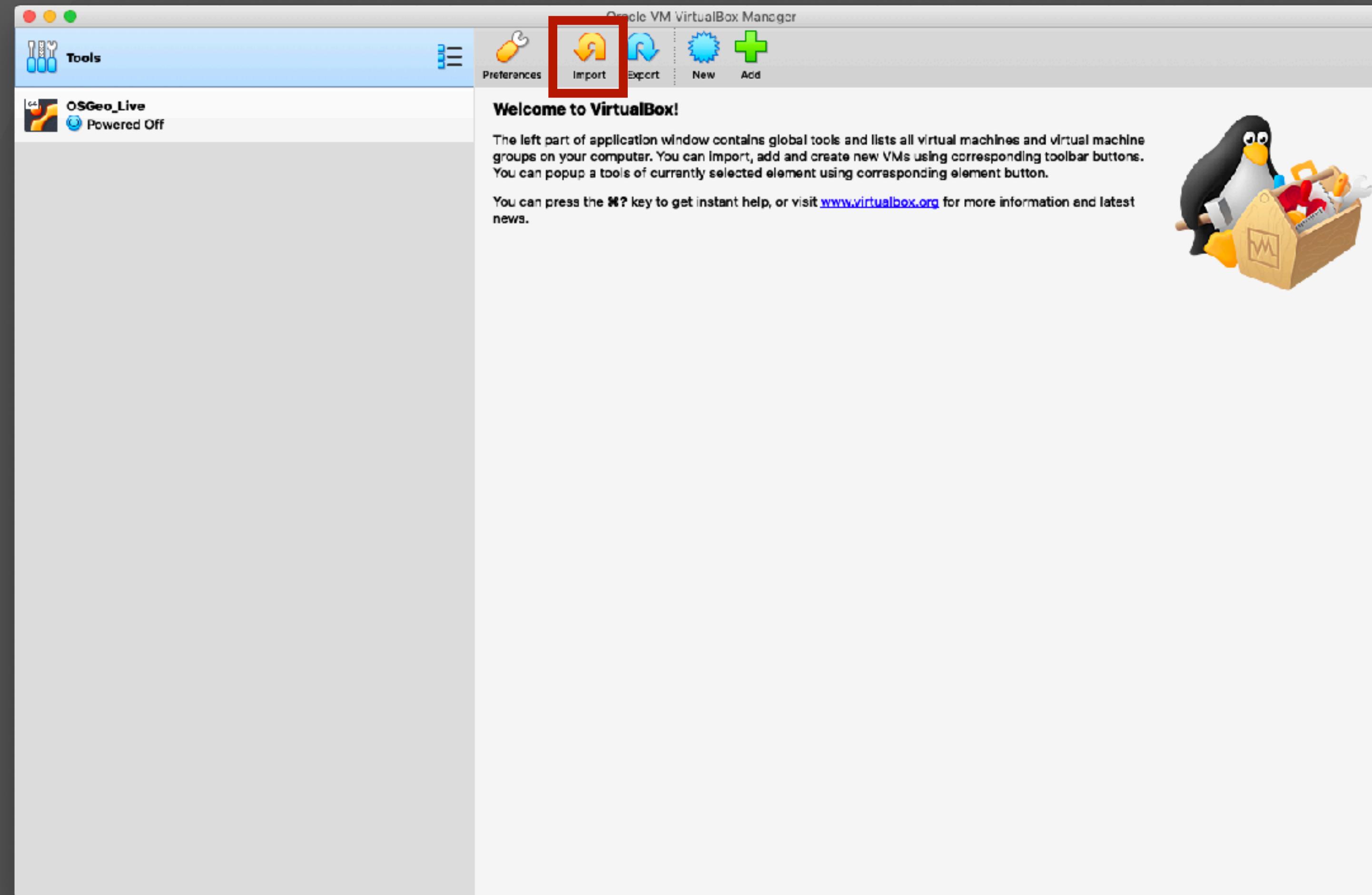
## Prerequisite Software

- **VirtualBox** : <https://www.virtualbox.org/wiki/Downloads>
- **OSGEO Live VM Image** : <http://bit.ly/2WzNEBL>
- VM Password : 123456
- **QGIS** : <https://www.qgis.org/en/site/forusers/download.html>



# Install OSGEO Live

## Import OVA File

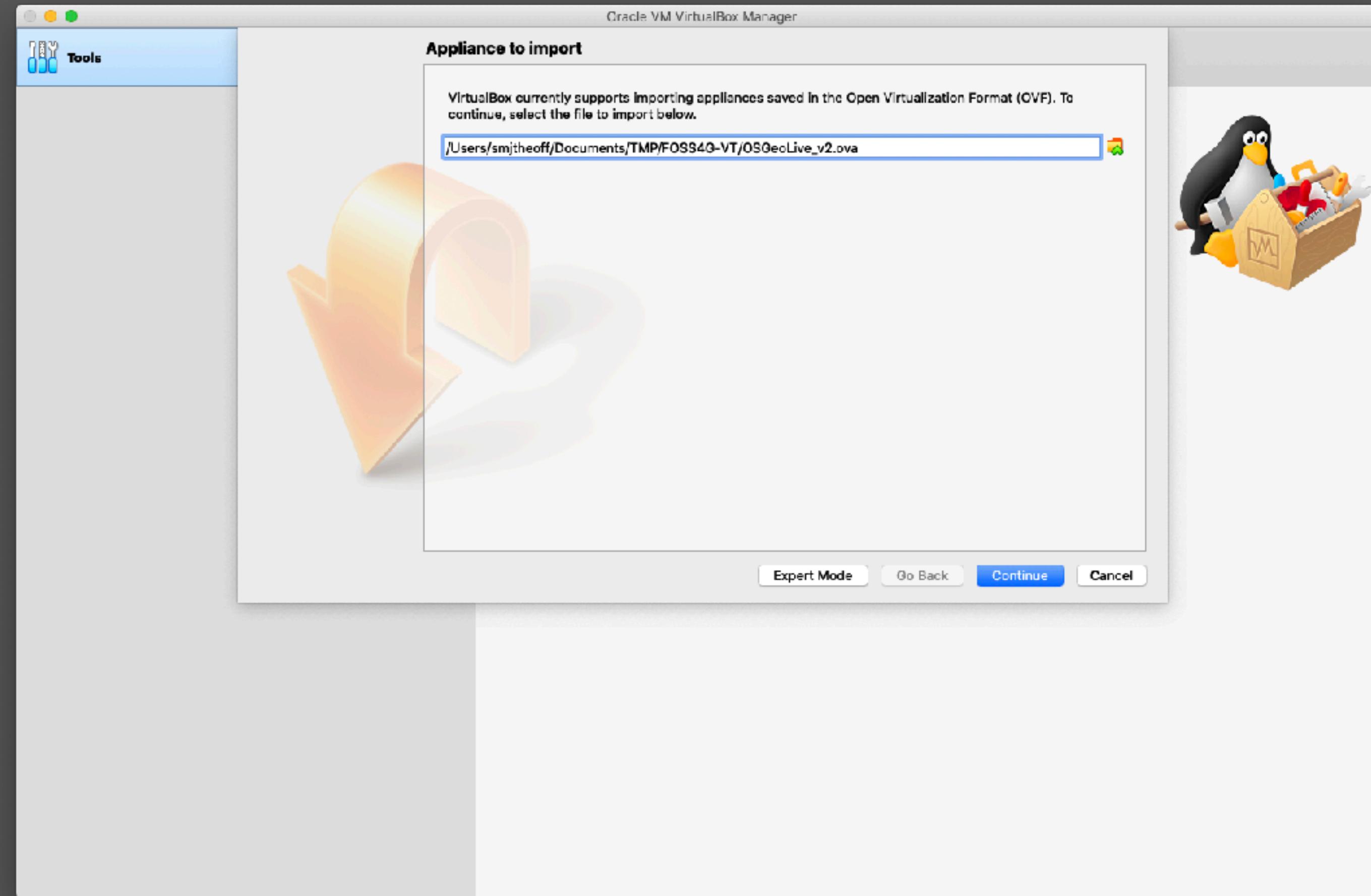




# Install OSGeo Live

## Import OVA File

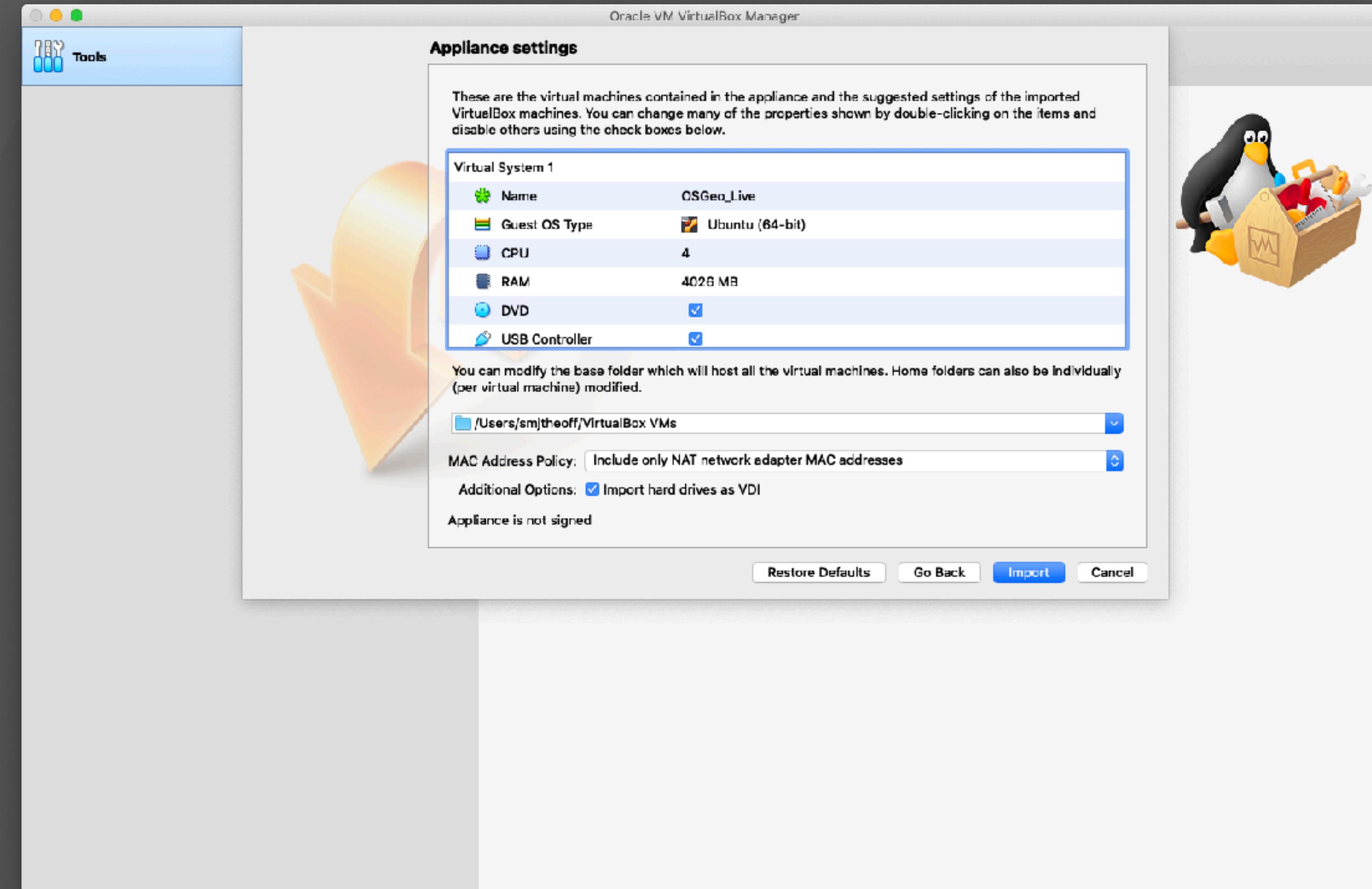
- Select ova File from Download
- Continue



# Install OSGEO Live

## Config VM Spec

- Click : Import





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# Install OSGEO Live

Run VM





# Step to Processing



## Data Preparation

Convert Data from other geometry  
file to GeoJSON



## Vector Tiles Processing

Process Vector Tile from GeoJSON  
to mbtiles file



## Vector Tiles Hosting

Hosting mbtile file for service map  
map

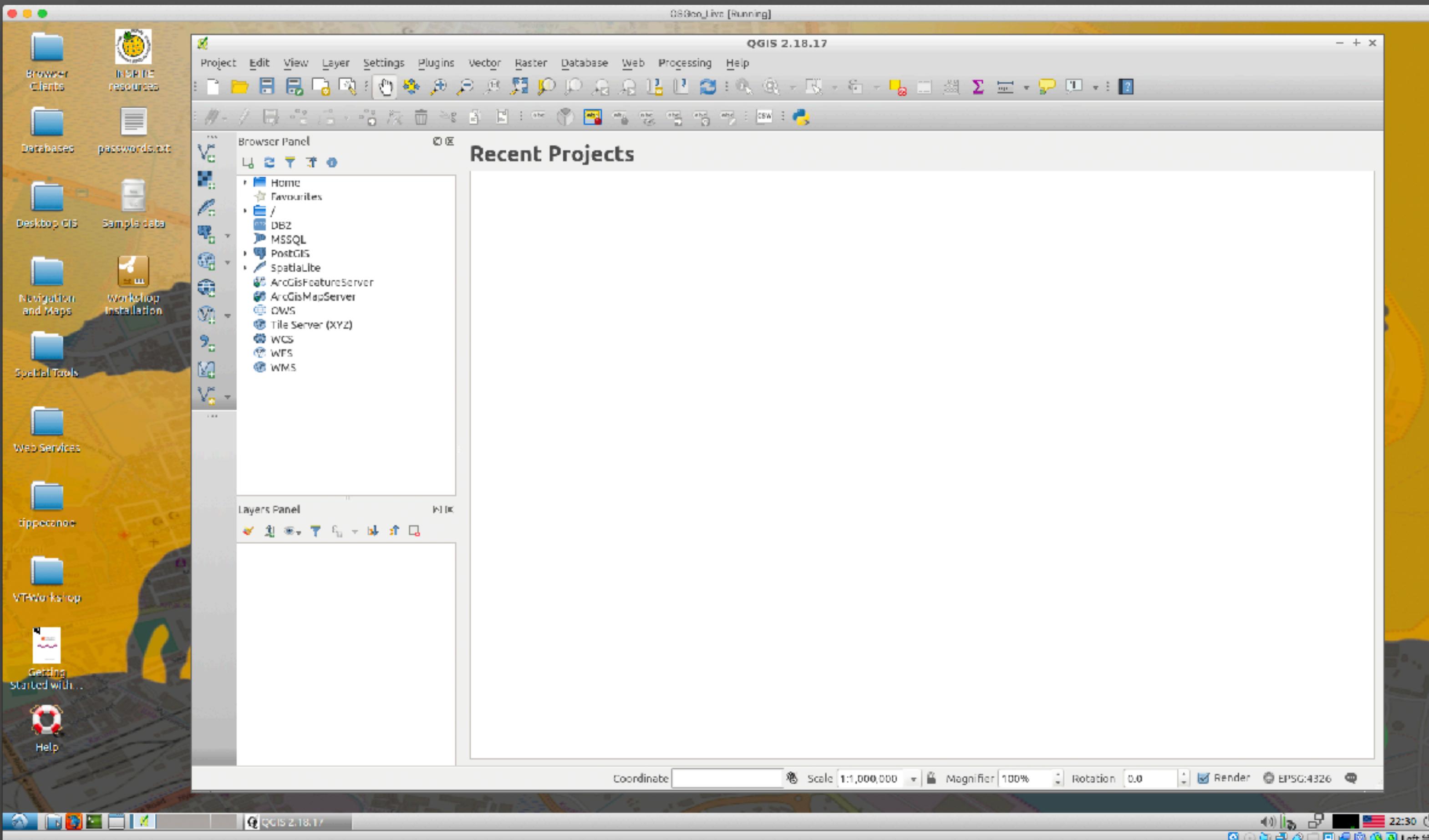


## Application

# Data Preparation

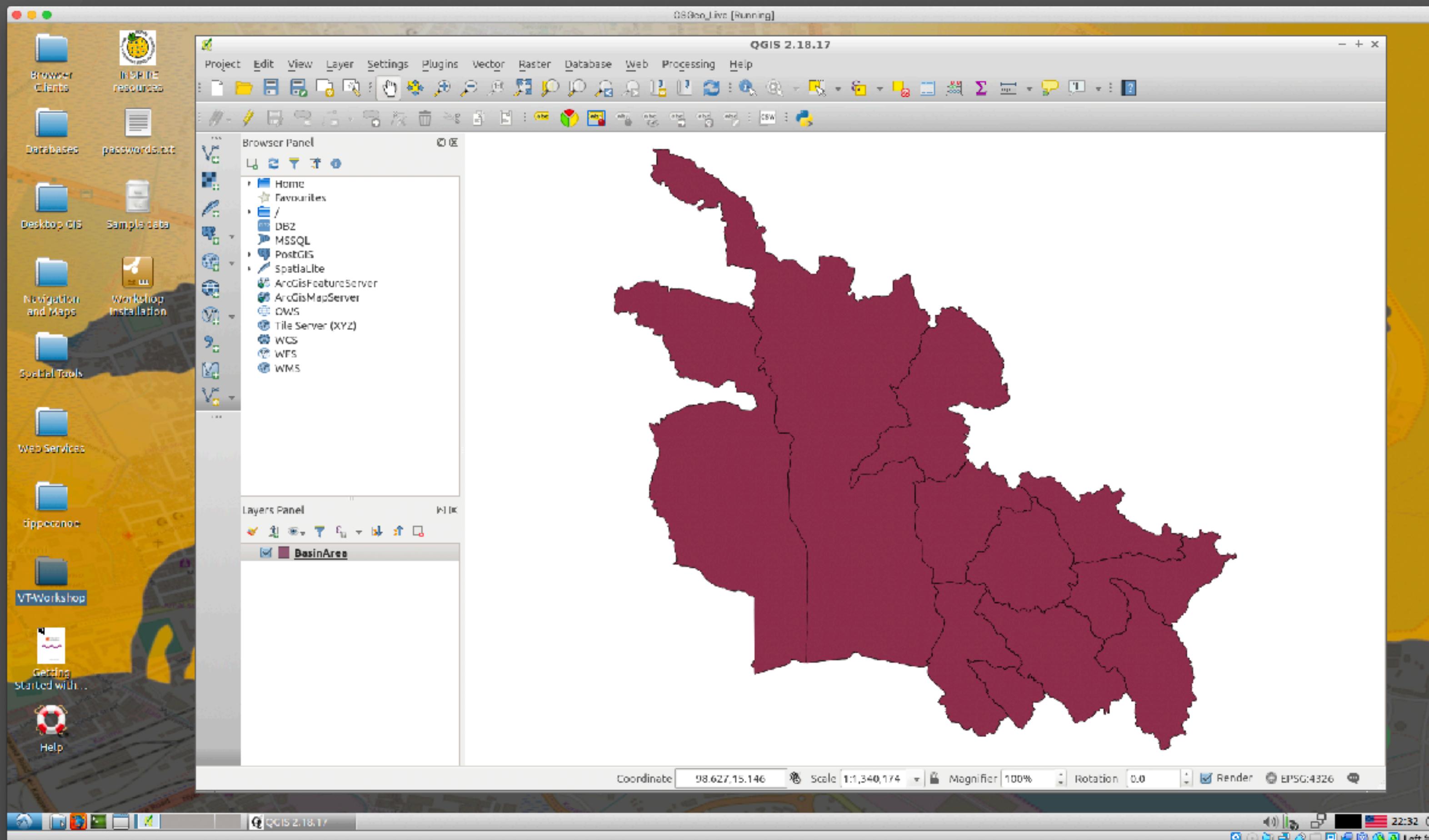
## Data Condition

- **Geometry Only**
- **SRID : 4326 (WGS1984)**
- **Encoding : UTF-8**



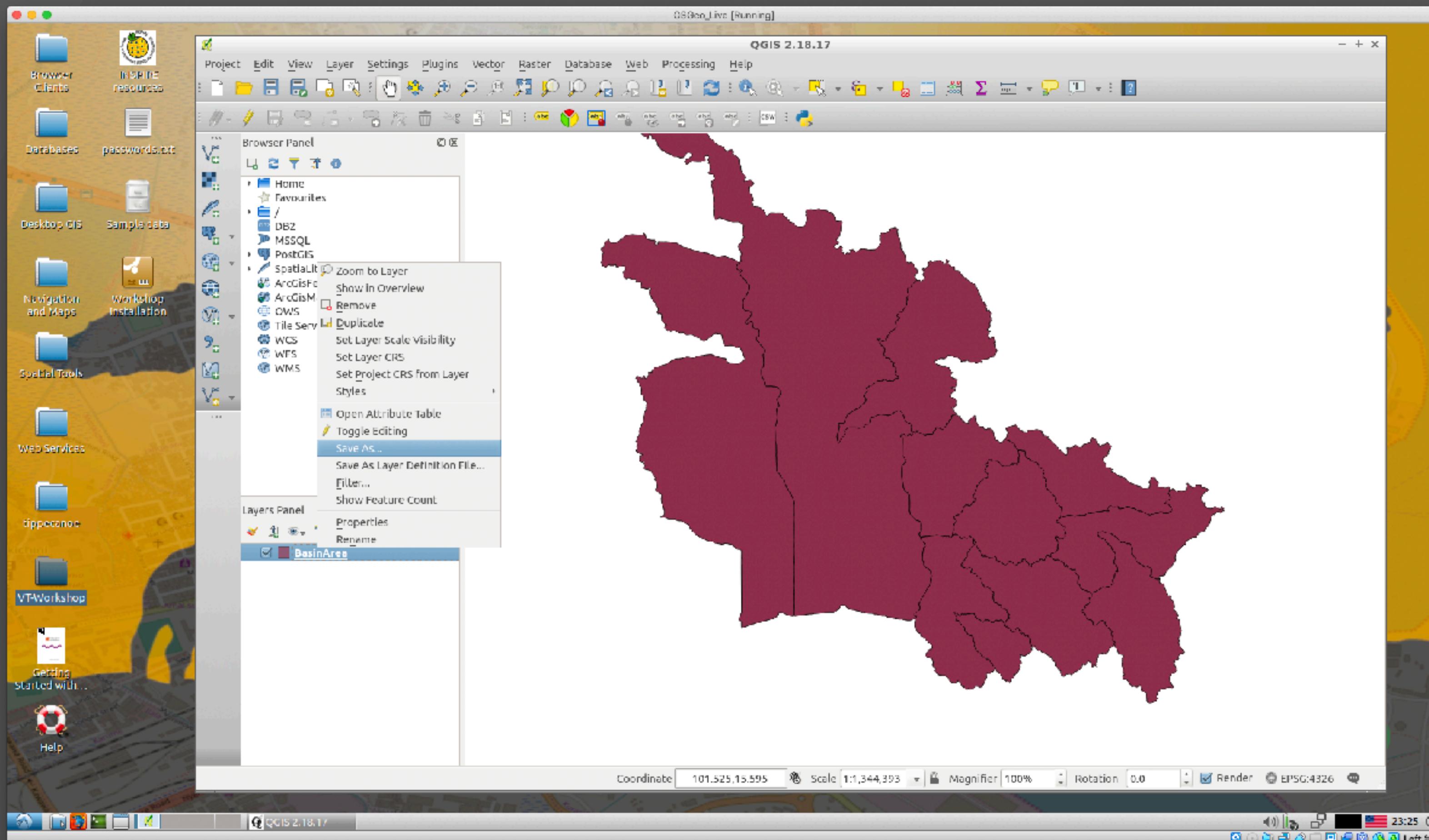
# Data Preparation

## Import Geometry to QGIS



# Data Preparation

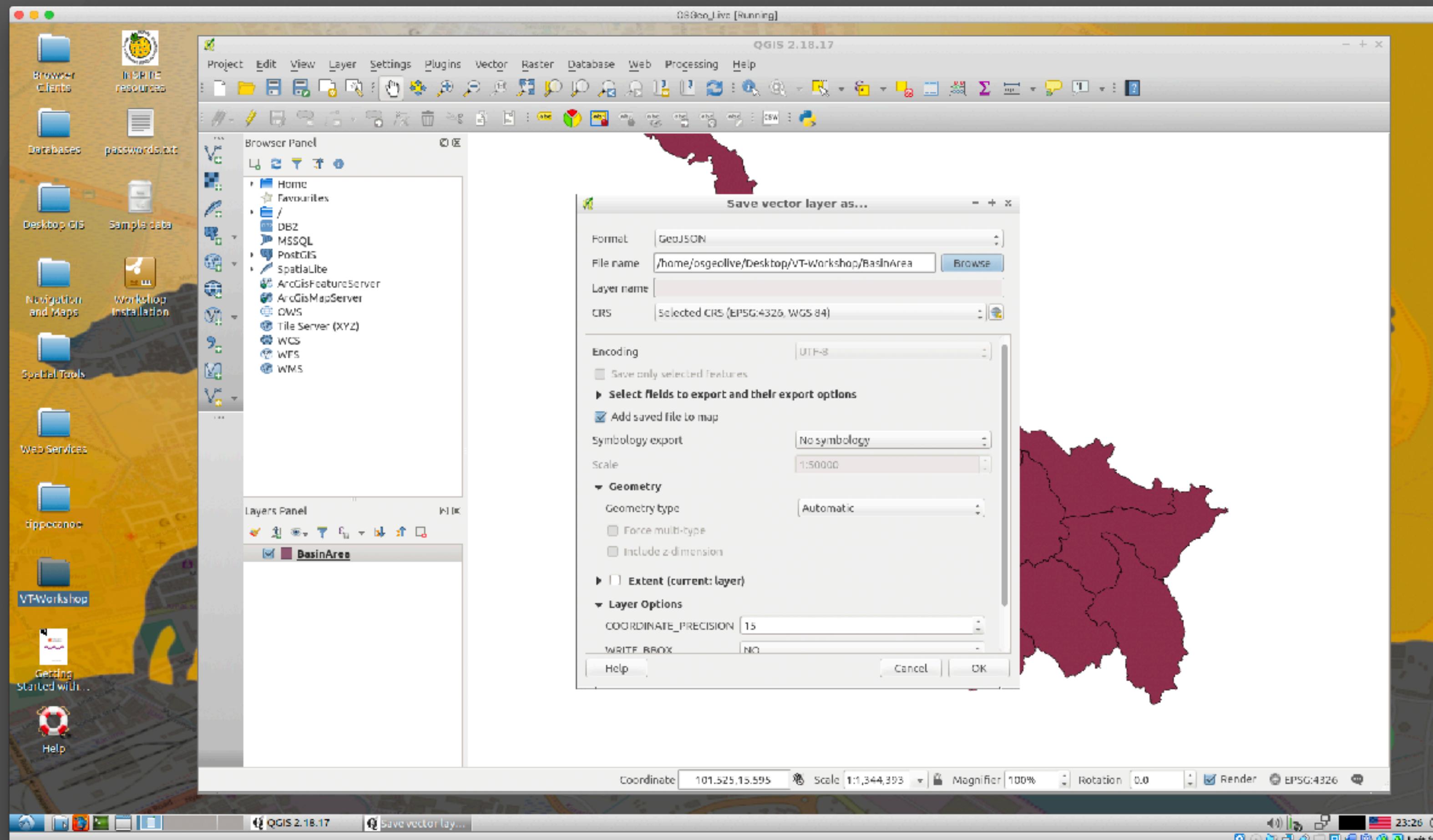
## Export to GeoJSON



# Data Preparation

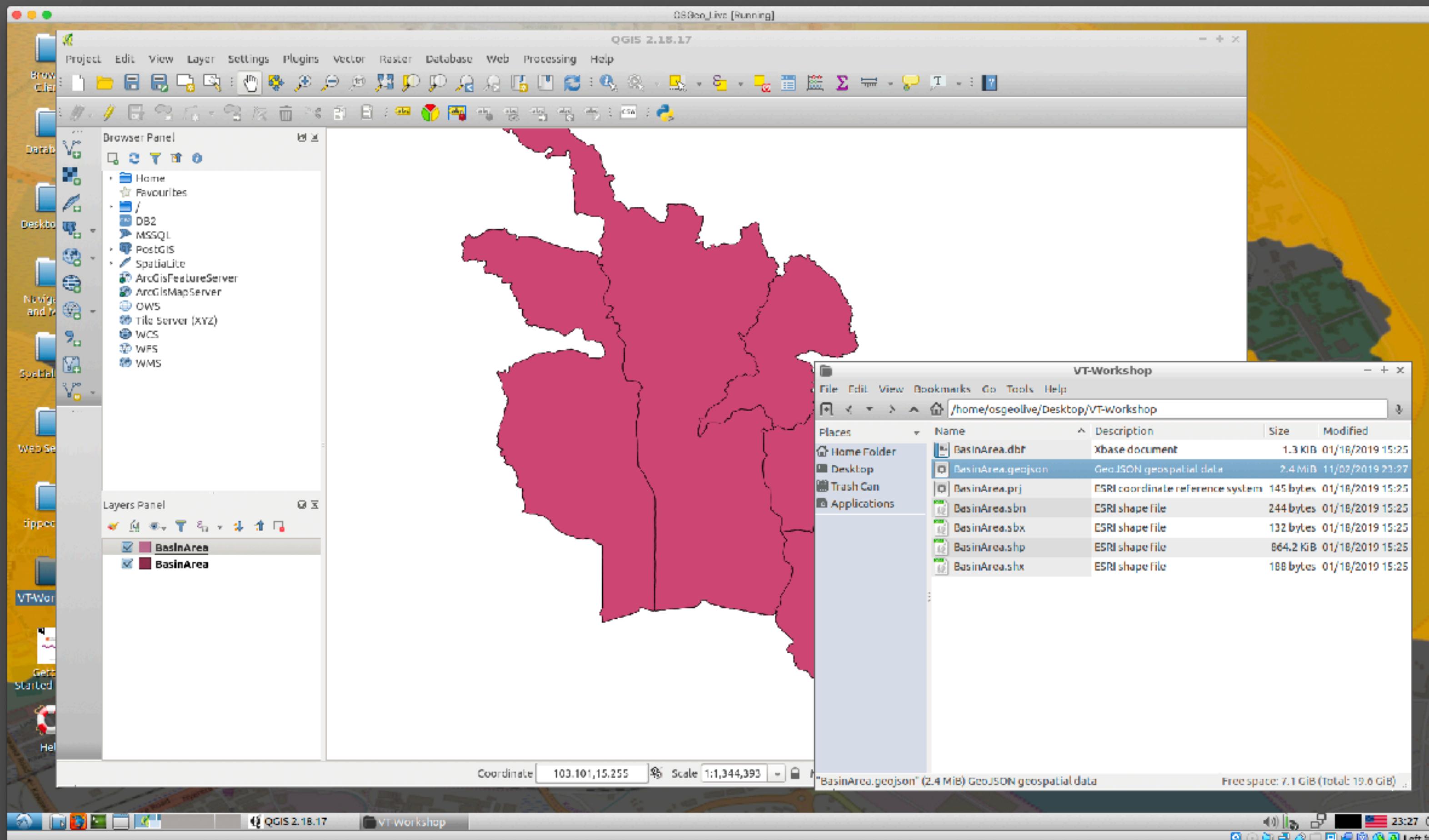
## Export to GeoJSON

- Format : GeoJSON
- File Name : Save to Data
- Directory
- Click : OK



# Data Preparation

Export to GeoJSON Success

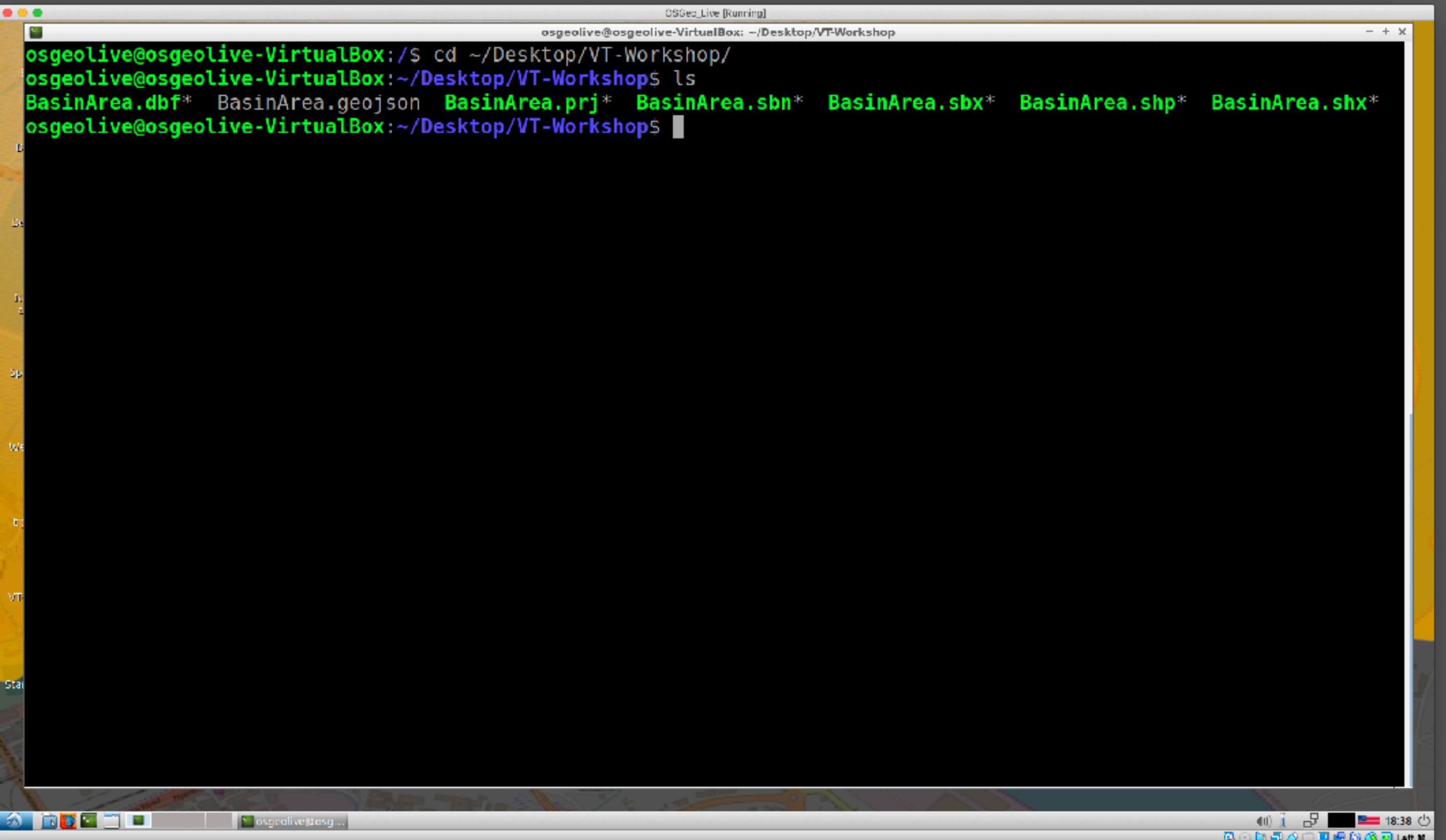


# Vector Tiles Processing

## RUN Command for convert

### GeoJSON to mbtiles

1. Change Directory to workshop directory



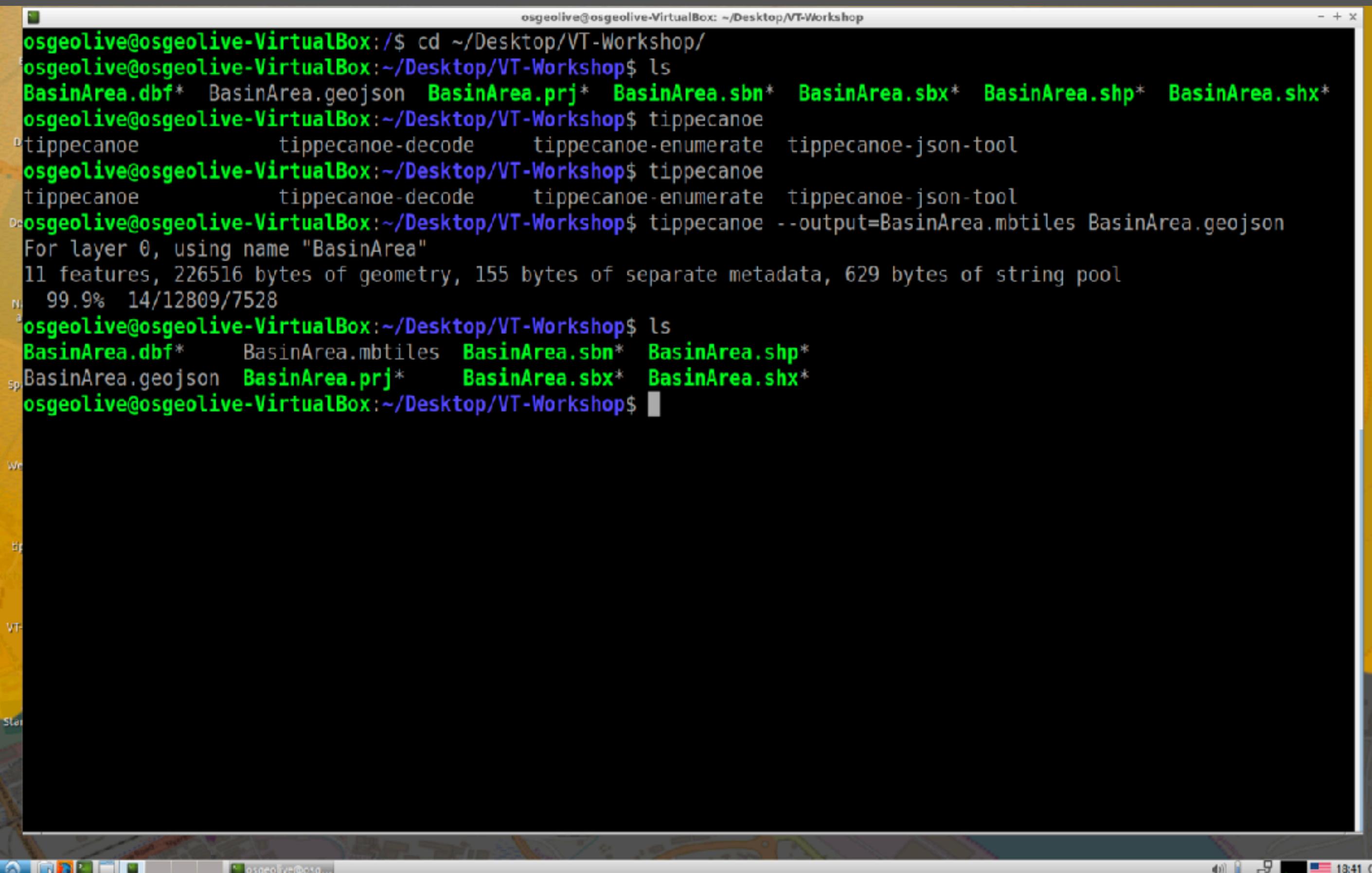
```
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ ls
BasinArea.dbf*  BasinArea.geojson  BasinArea.prj*  BasinArea.sbn*  BasinArea.sbx*  BasinArea.shp*  BasinArea.shx*
```

# Vector Tiles Processing

**RUN Command for convert  
GeoJSON to mbtiles**

**RUN**

```
$ tippecanoe --output=BasinArea.mbtiles BasinArea.geojson
```



The screenshot shows a terminal window with a black background and white text. The user is in a directory named 'VT-Workshop'. They run the command \$ tippecanoe --output=BasinArea.mbtiles BasinArea.geojson. The terminal output shows the progress of the conversion, indicating 11 features, 226516 bytes of geometry, 155 bytes of separate metadata, and 629 bytes of string pool. The process is at 99.9% completion, with 14/12809 features processed. Finally, the user runs ls to show the contents of the directory, which now includes the newly created BasinArea.mbtiles file.

```
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ cd ~/Desktop/VT-Workshop/
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ ls
BasinArea.dbf*  BasinArea.geojson  BasinArea.prj*  BasinArea.sbn*  BasinArea.sbx*  BasinArea.shp*  BasinArea.shx*
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ tippecanoe
tippecanoe          tippecanoe-decode    tippecanoe-enumerate  tippecanoe-json-tool
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ tippecanoe
tippecanoe          tippecanoe-decode    tippecanoe-enumerate  tippecanoe-json-tool
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ tippecanoe --output=BasinArea.mbtiles BasinArea.geojson
For layer 0, using name "BasinArea"
11 features, 226516 bytes of geometry, 155 bytes of separate metadata, 629 bytes of string pool
N 99.9% 14/12809/7528
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ ls
BasinArea.dbf*  BasinArea.mbtiles  BasinArea.sbn*  BasinArea.shp*
BasinArea.geojson  BasinArea.prj*  BasinArea.sbx*  BasinArea.shx*
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$
```

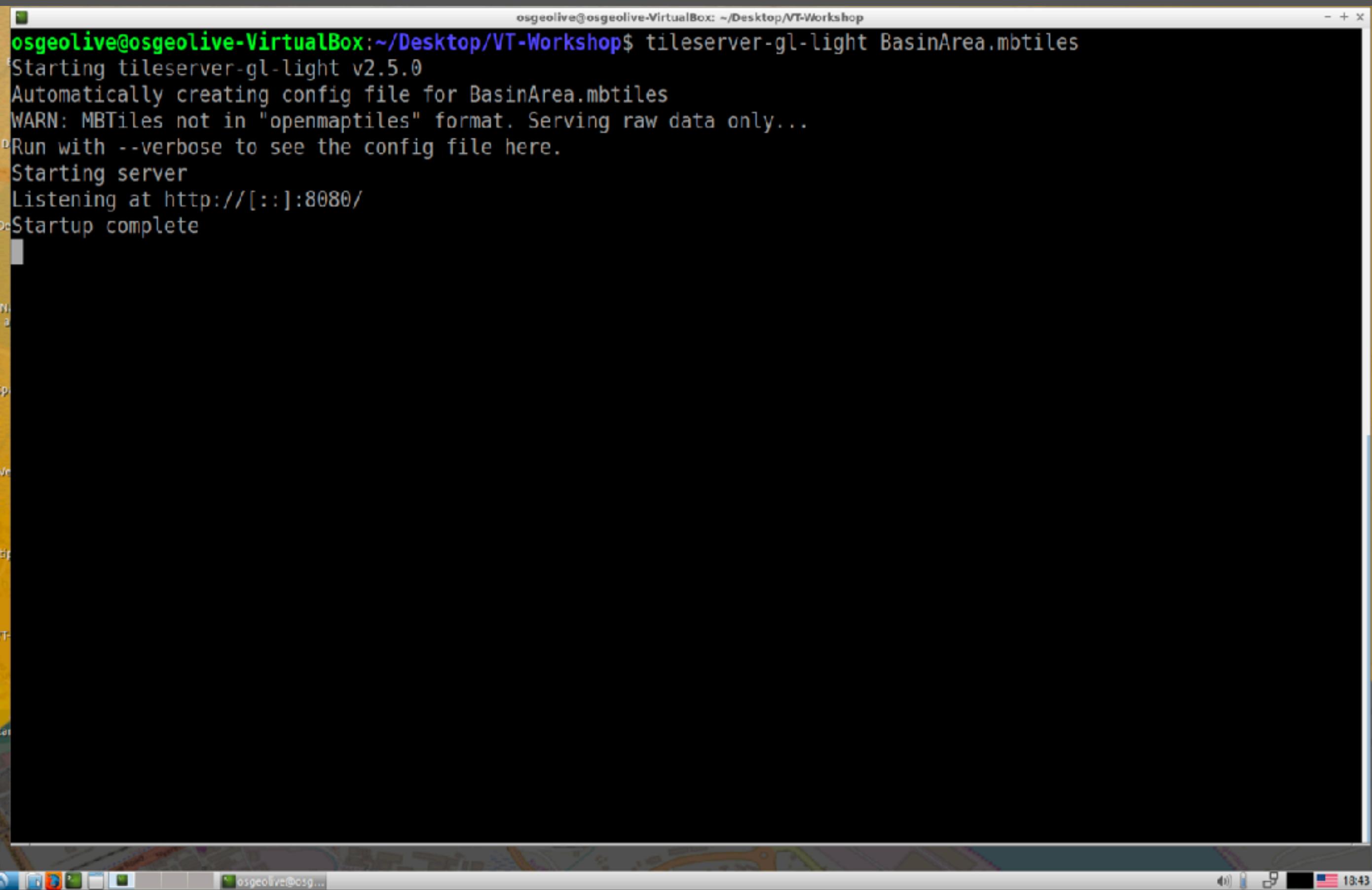
# Vector Tiles Hosting

**RUN Server for hosting**

**Vector Tile**

**RUN**

```
$ tileserver-gl-light BasinArea.mbtiles
```



The screenshot shows a terminal window with a black background and white text. The command `tileserver-gl-light BasinArea.mbtiles` is entered at the prompt. The output shows the server starting up, creating a config file, and listening on port 8080. A warning message indicates that the MBTiles file is not in "openmaptiles" format and is serving raw data.

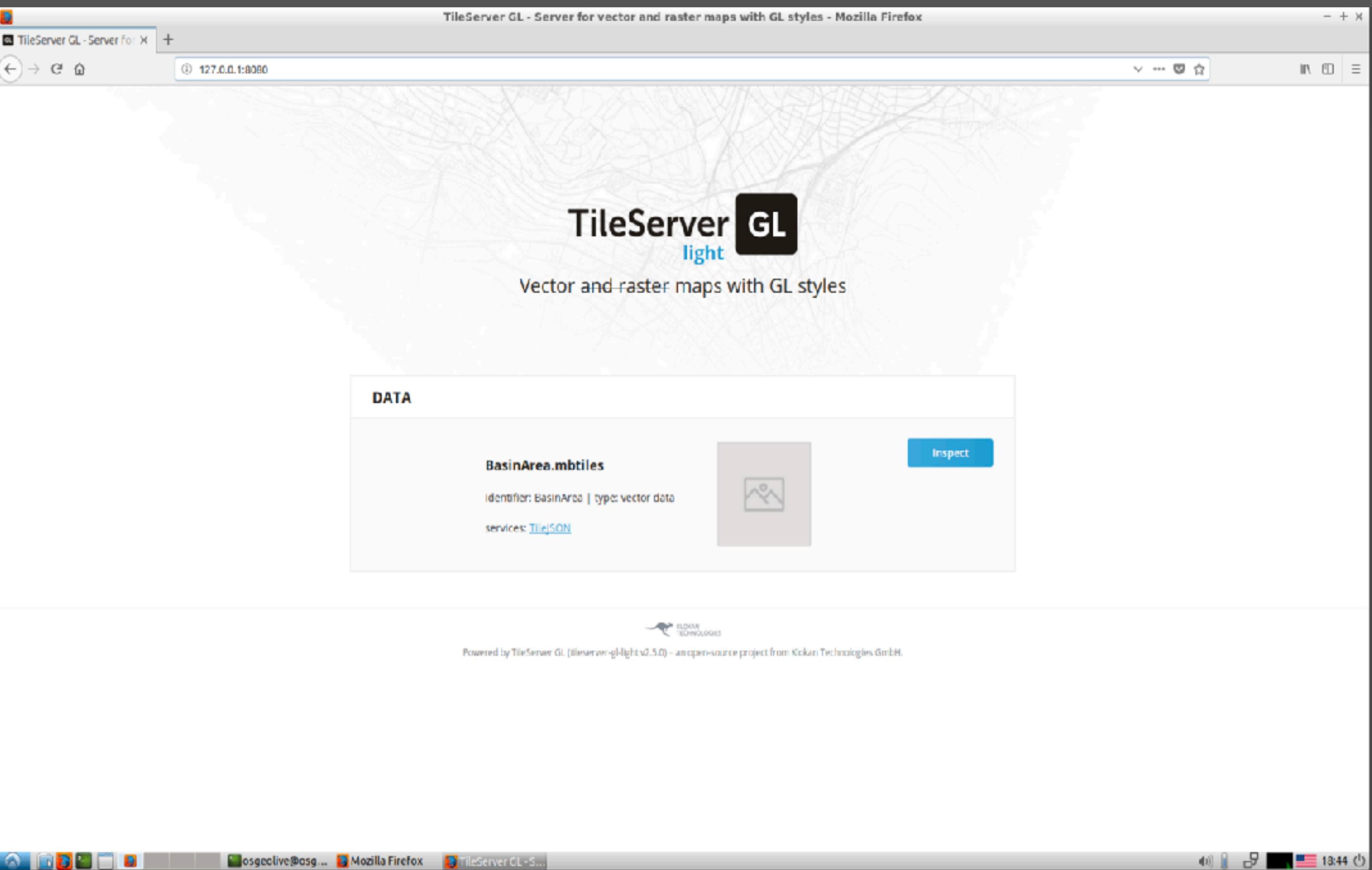
```
osgeolive@osgeolive-VirtualBox:~/Desktop/VT-Workshop$ tileserver-gl-light BasinArea.mbtiles
Starting tileserver-gl-light v2.5.0
Automatically creating config file for BasinArea.mbtiles
WARN: MBTiles not in "openmaptiles" format. Serving raw data only...
Run with --verbose to see the config file here.
Starting server
Listening at http://[::]:8080/
Startup complete
```

# Vector Tiles Hosting

## Using Vector Tiles

RUN In Firefox

<http://127.0.0.1:8080>

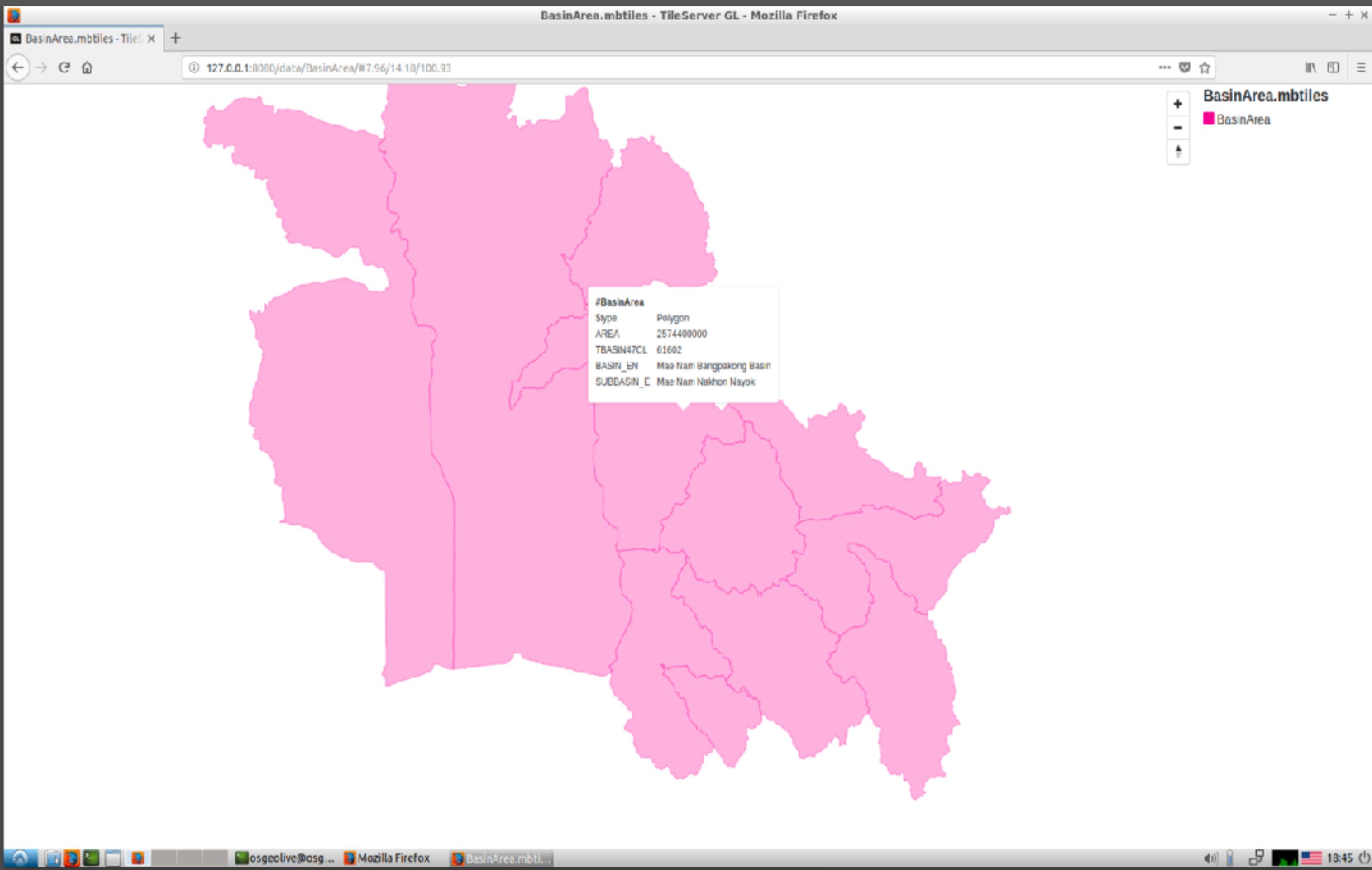




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# Vector Tiles Hosting

## Inspect Vector Tiles



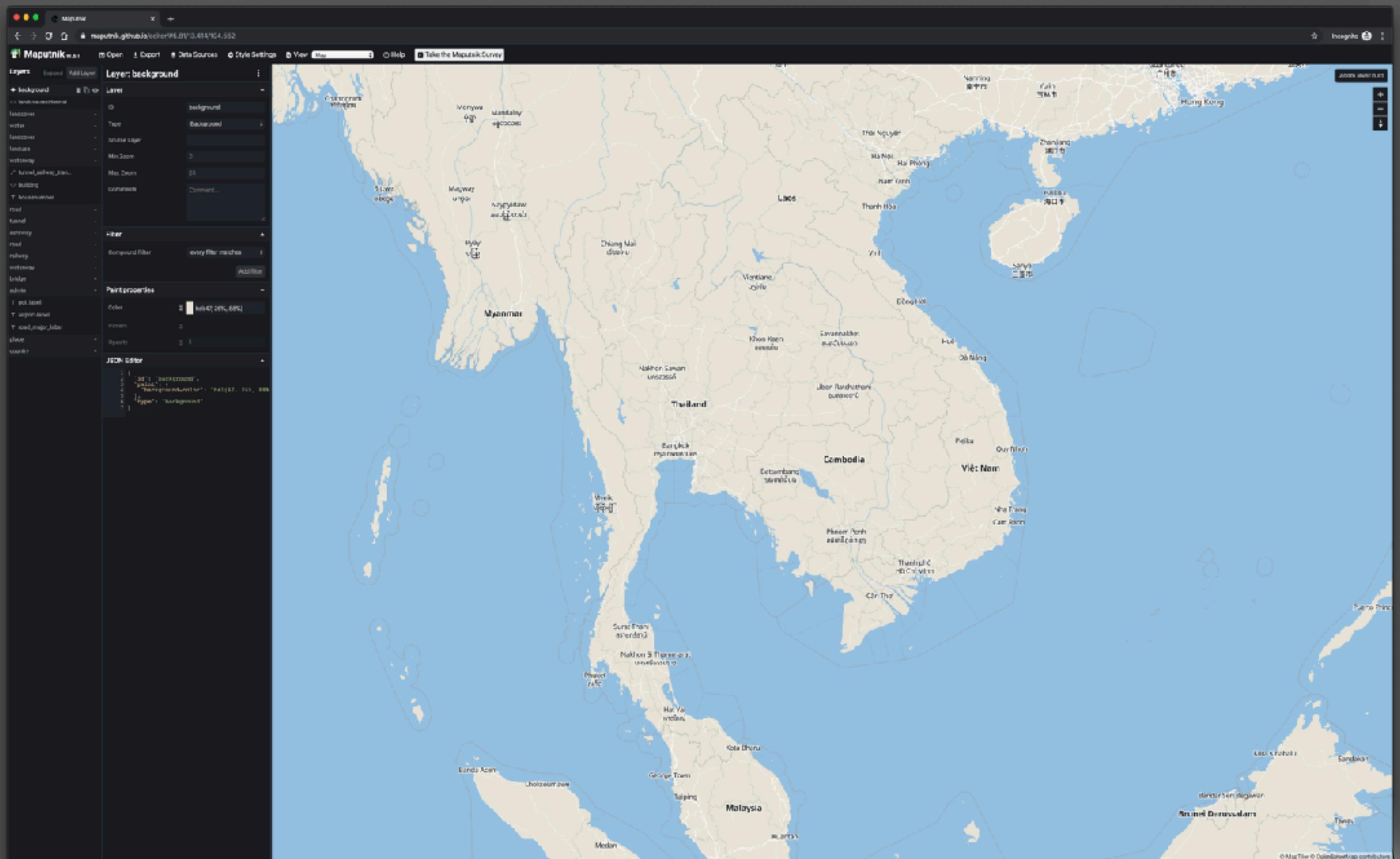


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# Application

## Styling Vector Tiles

<https://maputnik.github.io/editor>



# Application

**Application**

GIT : <https://github.com/smjtheoff/foss4g-2019-vt/>

