

Geographic Information Systems

WMTS: Convert geolocation (lat, long) to tile index, at a given zoom level?

Asked 8 years ago Modified 2 years, 6 months ago Viewed 26k times



I wanted to know how to get the indexes (x,y) of a WMTS tile for a given geolocation (latitude, longitude) and zoom level.





For exemple, I have a POI located at (48.675, 2.7), I want to get the corresponding open-street-map tile for the zoom 10.



Can I do the math? Do I need a webservice? Precision: I have to do this programmatically.



development

wmts

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edited Feb 5, 2015 at 11:00

SS_Rebelious **5,581** 2 25

asked Feb 5, 2015 at 10:37



2 Here you go: wiki.openstreetmap.org/wiki/... – John Powell Feb 6, 2015 at 8:38

A useful MSDN Article on the Bing Maps Tiling Scheme also provides a good primer. Both this and the OSM article assume Web Mercator projection, but the principle is the same for other projected co-ordinate systems. – kes Feb 6, 2015 at 14:48

1 Answer

Sorted by:

Highest score (default)

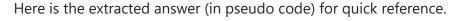




The OSM wiki page is perfect:

http://wiki.openstreetmap.org/wiki/Slippy map tilenames#Lon..2Flat. to tile numbers 2







Given Longitude/latitude/zoom to tile numbers :



```
n = 2 ^ zoom
xtile = n * ((lon_deg + 180) / 360)
ytile = n * (1 - (log(tan(lat_rad) + sec(lat_rad)) / π)) / 2
```

Note that log() in this pseudo code refers to natural log (often "ln()" in common math syntax, but often "log()" in many programming languages).

Given Tile numbers to longitude/latitude:

```
\begin{array}{l} n = 2 \ ^{\prime} \ zoom \\ lon\_deg = xtile \ / \ n \ ^{\prime} \ 360.0 \ ^{\prime} \ 180.0 \\ lat\_rad = arctan(sinh(\pi \ ^{\prime} \ (1 \ ^{\prime} \ 2 \ ^{\prime} \ ytile \ / \ n))) \\ lat\_deg = lat\_rad \ ^{\prime} \ 180.0 \ / \ \pi \end{array}
```

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edited Oct 3, 2018 at 23:36 ak112358

762 9 16

answered Feb 7, 2015 at 17:26



Neekobus

731 1 6

- wait, the OSM slippy format is the WMTS tile format? spy Dec 15, 2016 at 1:52 🖍
- 10 Note that the <u>link</u> above has implementations in *many* languages! (27 currently) Cyrille Mar 13, 2017 at 10:40
- Be aware that according to this link, latitude goes from 0 to 85.0511 °N (not 90 °N) and from 0 to 85.0511 °S (not 90 °S). The number 85.0511 is the result of $\arctan(\sinh(\pi))$. By using this bound, the entire map becomes a (very large) square AmirHossein Rezaei Jan 31, 2021 at 11:06 \nearrow