Lügen mit Statistik

OpenStreetMap-Edition

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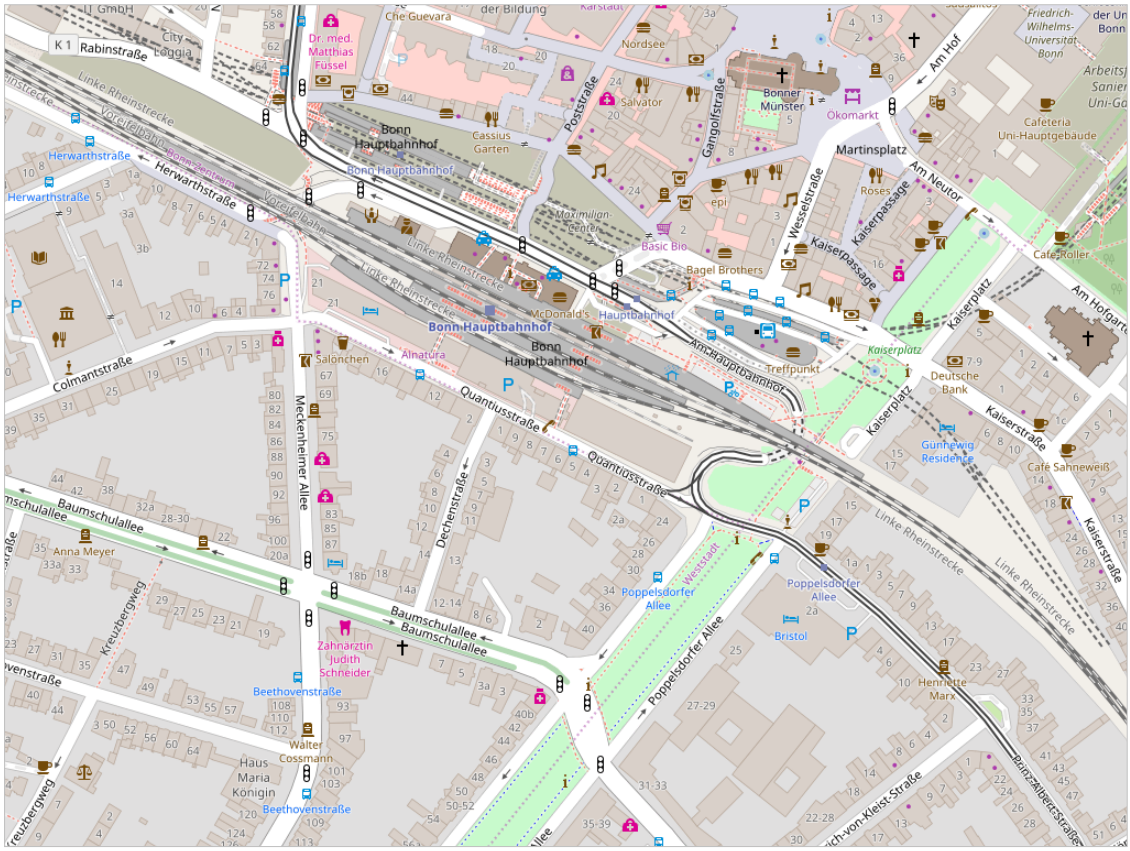
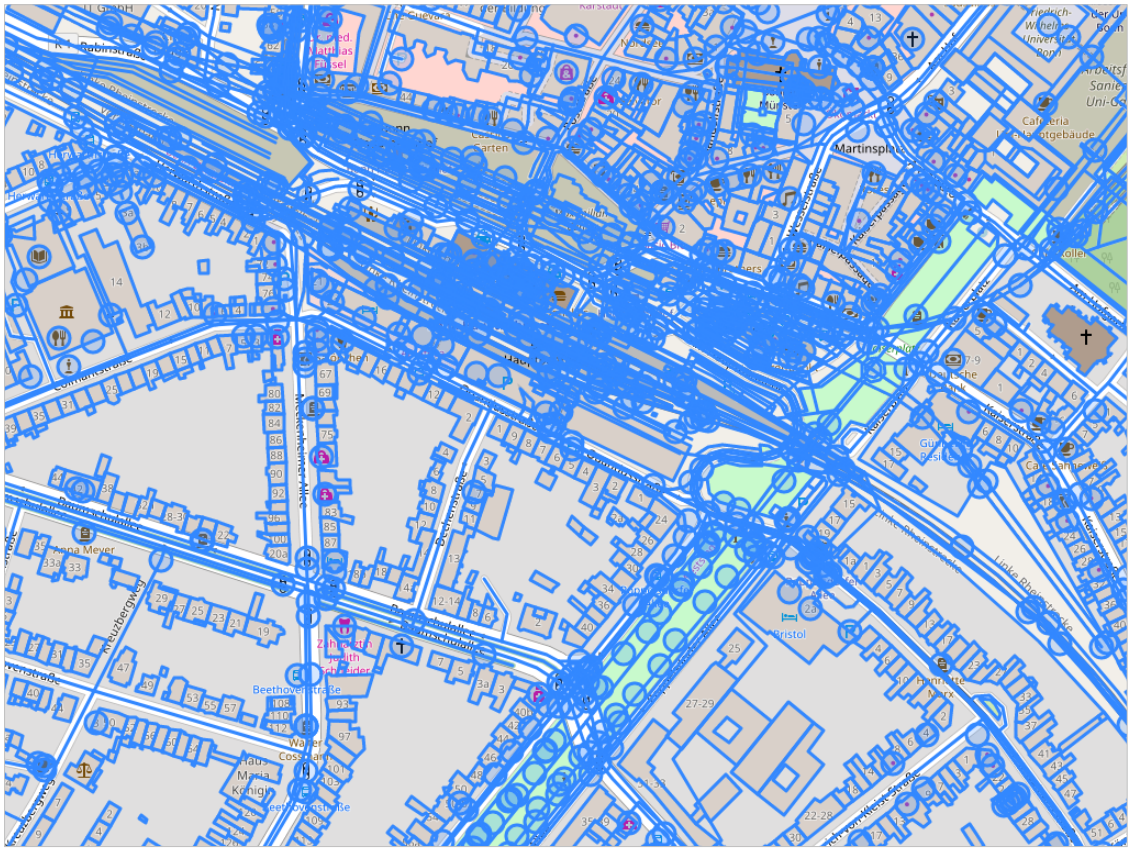
Dieses PDF enthält zu den Folien auch eine Zusammenfassung dessen, was im Vortrag gesagt wurde.

Zu dieser Folie:

Nicht immer sind es wirklich „Lügen“ - oft auch einfach Irrtümer oder Fehlinterpretationen.

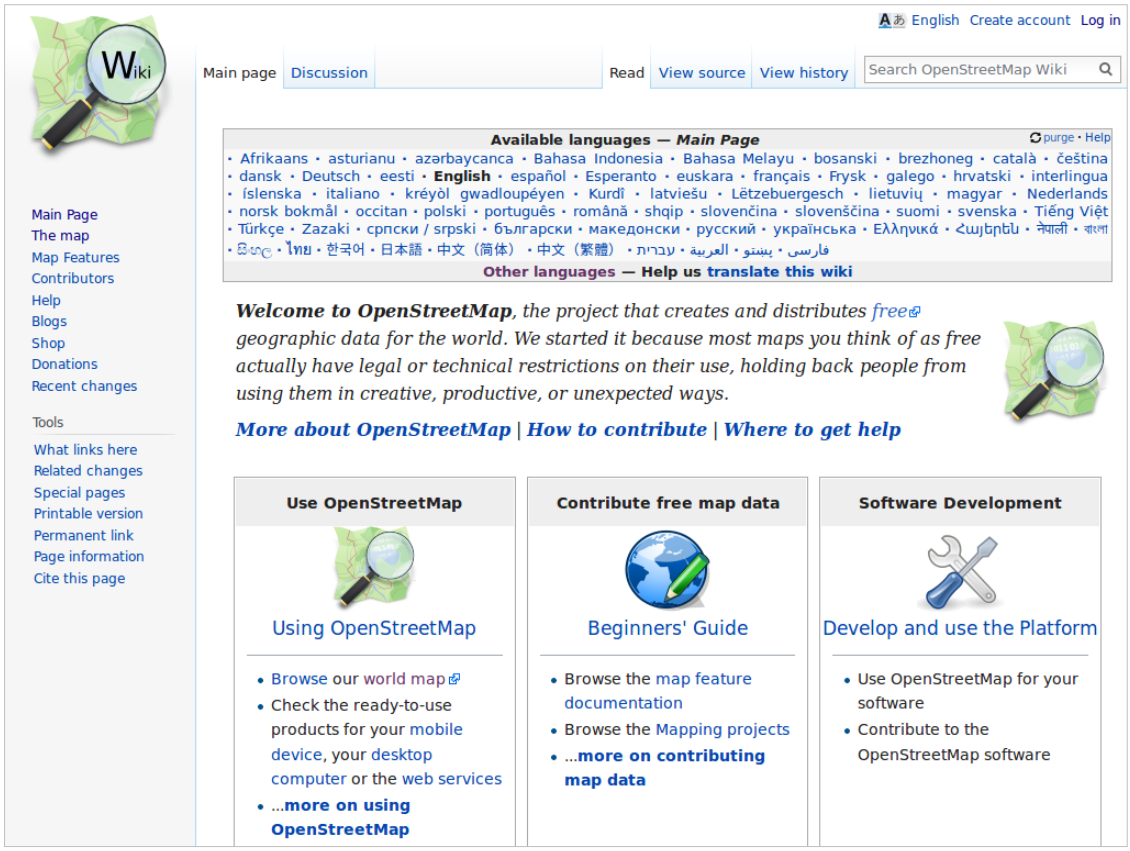


Dass man aus der Karte selbst nicht unbedingt Rückschlüsse auf Daten und Mapper ziehen kann, ist klar -

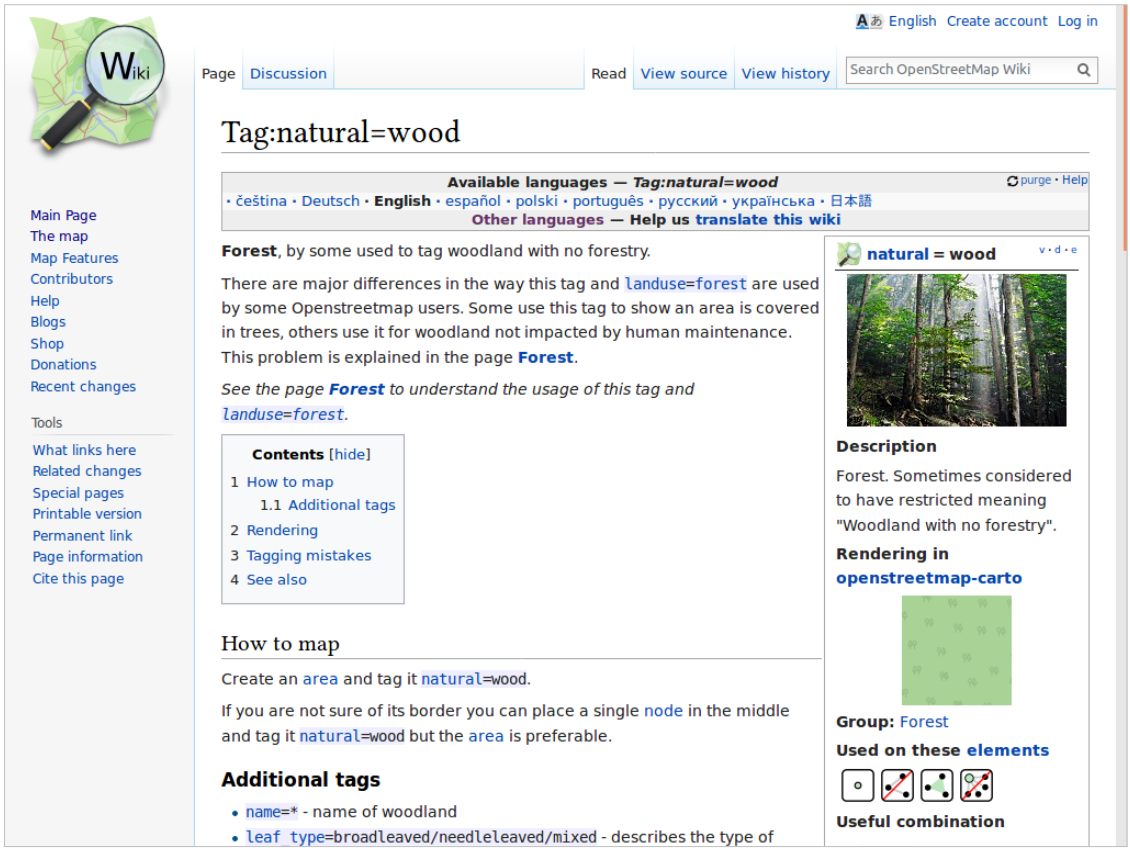


Viele Daten erscheinen gar nicht auf der Karte, z.B. die Straßenlaternen entlang der Grünanlage hier.

„Was gibt es eigentlich alles?“



Um sich zu informieren, welche Daten es bei OSM überhaupt gibt, schauen viele auf das Wiki (wiki.openstreetmap.org).



Die Wikiseite für natural=forest, eine der zwei Arten, wie in OSM Wald gemappt wird...

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Tag:power=transformer

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Cite this page

A power **Power Transformer** (421-01-01) static device which converts a given power voltage to another power voltage. A transformer is usually located within a `power=substation`.

In more technical terms, a power transformer is composed of two or more windings which, by electromagnetic induction, transforms a system of alternating voltage and current into another system of voltage and current for the purpose of transmitting electrical power. The delivery is done at the same frequency than the input.

Contents [hide]

1 How to map
2 Advanced mapping
- 2.1 Where do I find such data ?
- 2.2 Tagging
- 2.3 Transformer values
- 2.4 Location values
- 2.5 Transformers interfaces
  - 2.5.1 Voltage tagging
  - 2.5.2 Windings configuration
- 2.6 Transformer sets

3 Examples
- 3.1 Transmission transformers
- 3.2 Distribution transformers
- 3.3 Traction transformers
- 3.4 Auxiliary transformers

power = transformer v · d · e

Description

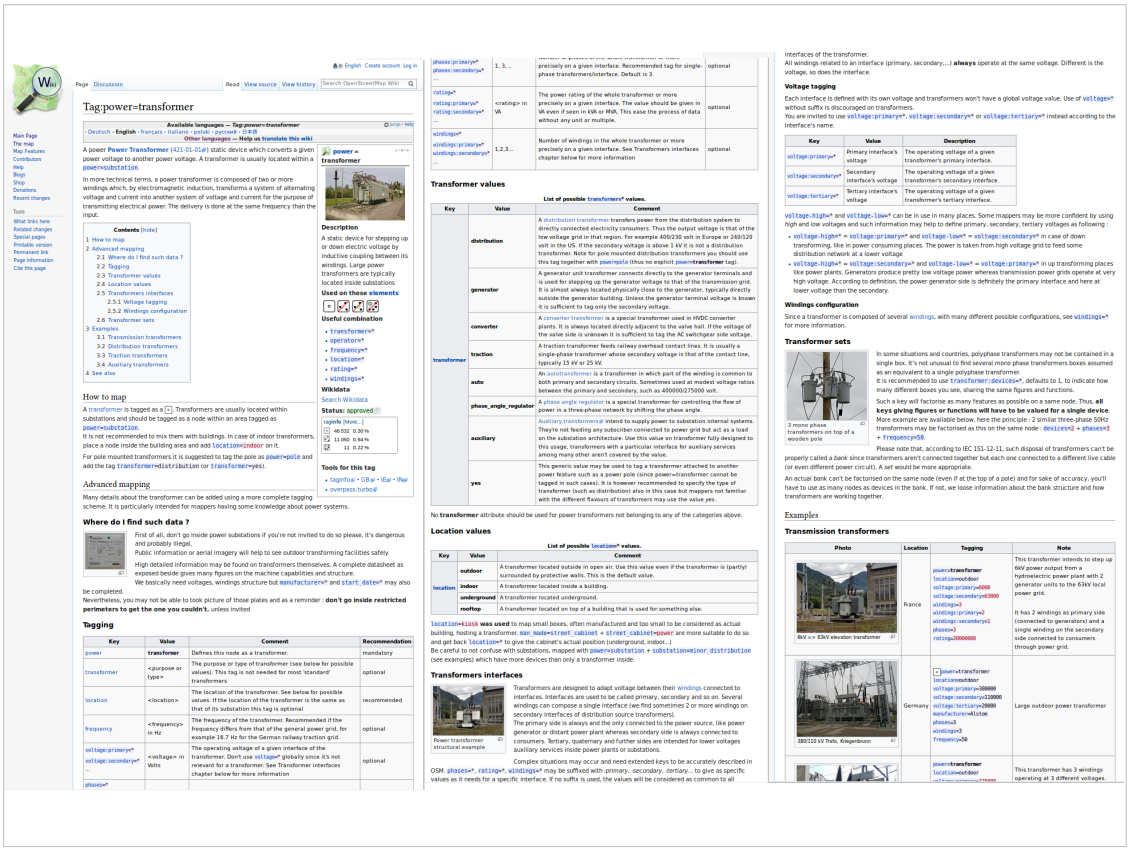
A static device for stepping up or down electric voltage by inductive coupling between its windings. Large power transformers are typically located inside substations

Used on these elements

Useful combination

- `transformer=*`
- `operator=*`
- `frequency=*`
- `location=*`

Und im Vergleich dazu power=transformer.



Tag:power=transformer

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2.5.1 Voltage tagging
2.5.2 Windings configuration
2.6 Transformer sets
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3.2 Distribution transformers
3.3 Traction transformers
3.4 Auxiliary transformers
4 See also

power = transformer

Description

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Used on these elements

Useful combination

- transformer=*
- operator=*
- frequency=*
- location=*
- rating=*
- windings=*

Wikidata

Search Wikidata

Status: approved

How to map

A transformer is tagged as a + . Transformers are usually located within substations and should be tagged as a node within an area tagged as power=substation.

It is not recommended to mix them with buildings. In case of indoor transformers, place a node inside the building area and add location=indoor on it.

For pole mounted transformers it is suggested to tag the pole as power=pole and add the tag transformer=distribution (or transformer=yes).

Advanced mapping

Many details about the transformer can be added using a more complete tagging scheme. It is particularly intended for mappers having some knowledge about power systems.

Where do I find such data ?

First of all, don't go inside power substations if you're not invited to do so please, it's dangerous and probably illegal.

Public information or aerial imagery will help to see outdoor transforming facilities safely.

High detailed information may be found on transformers themselves. A complete datasheet as exposed beside gives many figures on the machine capabilities and structure.

We basically need voltages, windings structure but manufacturer=* and start_date=* may also be completed.

Nevertheless, you may not be able to took picture of those plates and as a reminder : **don't go inside restricted perimeters to get the one you couldn't.** unless invited

Tagging

Key	Value	Comment	Recommendation
power	**transformer**	Defines this node as a transformer.	mandatory
transformer	<purpose or type>	The purpose or type of transformer (see below for possible values). This tag is not needed for most 'standard' transformers	optional
location	<location>	The location of the transformer. See below for possible values. If the location of the transformer is the same as that of its substation this tag is optional	recommended
frequency	<frequency> in Hz	The frequency of the transformer. Recommended if the frequency differs from that of the general power grid, for example 16.7 Hz for the German railway traction grid.	optional
voltage:primary=* voltage:secondary=* ...	<voltage> in Volts	The operating voltage of a given interface of the transformer. Don't use voltage=* globally since it's not relevant for a transformer. See Transformer interfaces chapter below for more information	optional
phases=*			
phases:primary=* phases:secondary=* ...	1, 3, ..	precisely on a given interface. Recommended tag for single-phase transformers/interface. Default is 3.	optional
rating=* rating:primary=* rating:secondary=* ...	<rating> in VA	The power rating of the whole transformer or more precisely on a given interface. The value should be given in VA even if seen in kVA or MVA. This ease the process of data without any unit or multiple.	optional
windings=* windings:primary=* windings:secondary=* ...	1,2,3...	Number of windings in the whole transformer or more precisely on a given interface. See Transformers interfaces chapter below for more information	optional

Transformer values

List of possible transformer=* values.

Key	Value	Comment
transformer	distribution	A distribution transformer transfers power from the distribution system to directly connected electricity consumers. Thus the output voltage is that of the low-voltage grid in that region. For example 400/230 volt in Europe or 240/120 volt in the US. If the secondary voltage is above 1 kV it is not a distribution transformer. Note for pole mounted distribution transformers you should use this tag together with powerpole (thus no explicit power=transformer tag).
	generator	A generator unit transformer connects directly to the generator terminals and is used for stepping up the generator voltage to that of the transmission grid. It is almost always located physically close to the generator, typically directly outside the generator building. Unless the generator terminal voltage is known it is sufficient to tag only the secondary voltage.
	converter	A converter transformer is a special transformer used in HVDC converter plants. It is always located directly adjacent to the valve hall. If the voltage of the valve side is unknown it is sufficient to tag the AC switchgear side voltage.
	traction	A traction transformer feeds railway overhead contact lines. It is usually a single-phase transformer whose secondary voltage is that of the contact line, typically 15 kV or 25 kV.
	auto	An autotransformer is a transformer in which part of the winding is common to both primary and secondary circuits. Sometimes used at modest voltage ratios between the primary and secondary, such as 400000/275000 volt.
	phase_angle_regulator	A phase angle regulator is a special transformer for controlling the flow of power in a three-phase network by shifting the phase angle.
	auxiliary	Auxiliary transformers@ intend to supply power to substation internal systems. They're not feeding any subscriber connected to power grid but act as a load on the substation architecture. Use this value on transformer fully designed to this usage, transformers with a particular interface for auxiliary services among many other aren't covered by the value.
	yes	This generic value may be used to tag a transformer attached to another power feature such as a power pole (since power=transformer cannot be tagged in such cases). It is however recommended to specify the type of transformer (such as distribution) also in this case but mappers not familiar with the different flavours of transformers may use the value yes.

No **transformer** attribute should be used for power transformers not belonging to any of the categories above.

Location values

List of possible location=* values.

Key	Value	Comment
location	outdoor	A transformer located outside in open air. Use this value even if the transformer is (partly) surrounded by protective walls. This is the default value.
	indoor	A transformer located inside a building.
	underground	A transformer located underground.
	rooftop	A transformer located on top of a building that is used for something else.

location=kiosk **was used** to map small boxes, often manufactured and too small to be considered as actual building, hosting a transformer. man_made=street_cabinet + street_cabinet=power are more suitable to do so and get back location=* to give the cabinet's actual position (underground, indoor...)

Be careful to not confuse with substations, mapped with power=substation + substation=minor_distribution (see examples) which have more devices than only a transformer inside.

Transformers interfaces

Power transformer structural example

Transformers are designed to adapt voltage between their windings connected to interfaces. Interfaces are used to be called primary, secondary and so on. Several windings can compose a single interface (we find sometimes 2 or more windings on secondary interfaces of distribution source transformers).

The primary side is always and the only connected to the power source, like power generator or distant power plant whereas secondary side is always connected to consumers. Tertiary, quaternary and further sides are intended for lower voltages auxiliary services inside power plants or substations.

Complex situations may occur and need extended keys to be accurately described in OSM. phases=*, rating=*, windings=* may be suffixed with :primary, :secondary, :tertiary... to give so specific values as it needs for a specific interface. If no suffix is used, the values will be considered as common to all interfaces of the transformer.

All windings related to an interface (primary, secondary,...) **always** operate at the same voltage. Different is the voltage, so does the interface.

Voltage tagging

Each interface is defined with its own voltage and transformers won't have a global voltage value. Use of voltage=* without suffix is discouraged on transformers.

You are invited to use voltage:primary=*, voltage:secondary=* or voltage:tertiary=* instead according to the interface's name.

Key	Value	Description
voltage:primary=*	Primary interface's voltage	The operating voltage of a given transformer's primary interface.
voltage:secondary=*	Secondary interface's voltage	The operating voltage of a given transformer's secondary interface.
voltage:tertiary=*	Tertiary interface's voltage	The operating voltage of a given transformer's tertiary interface.

voltage-high=* and voltage-low=* can be in use in many places. Some mappers may be more confident by using *high* and low voltages and such information may help to define primary, secondary, tertiary voltages as following :

- voltage-high=* = voltage:primary=* and voltage-low=* = voltage:secondary=* in case of down transforming, like in power consuming places. The power is taken from high voltage grid to feed some distribution network at a lower voltage
- voltage-high=* = voltage:secondary=* and voltage-low=* = voltage:primary=* in up transforming places like power plants. Generators produce pretty low voltage power whereas transmission power grids operate at very high voltage. According to definition, the power generator side is definitely the primary interface and here at lower voltage than the secondary.

Windings configuration

Since a transformer is composed of several windings, with many different possible configurations, see windings=* for more information.

Transformer sets

3 mono phase transformers on top of a wooden pole

In some situations and countries, polyphase transformers may not be contained in a single box. It's not unusual to find several mono phase transformers boxes assumed as an equivalent to a single polyphase transformer.

It is recommended to use transformer:devices=*, defaults to 1, to indicate how many different boxes you see, sharing the same figures and functions.

Such a key will factorise as many features as possible on a same node. Thus, **all keys giving figures or functions will have to be valued for a single device**. More example are available below, here the principle : 2 similar three-phase 50Hz transformers may be factorised as this on the same node : devices=2 + phases=3 + frequency=50.

Please note that, according to IEC 151-12-11, such disposal of transformers can't be properly called a *bank* since transformers aren't connected together but each one connected to a different live cable (or even different power circuit). A *set* would be more appropriate.

An actual bank can't be factorised on the same node (even if at the top of a pole) and for sake of accuracy, you'll have to use as many nodes as devices in the bank. If not, we loose information about the bank structure and how transformers are working together.

Examples

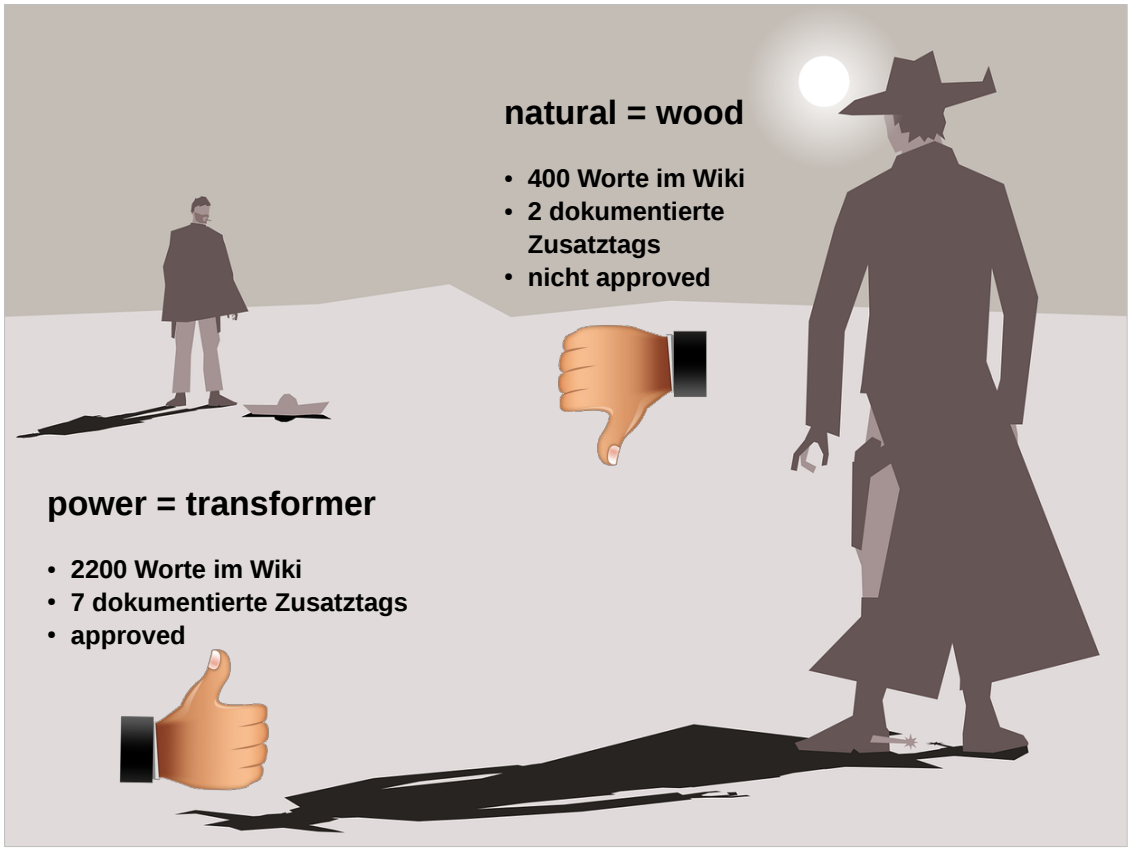
Transmission transformers

Photo	Location	Tagging	Note
6kV => 63kV elevation transformer	France	power=transformer location=outdoor voltage:primary=6000 voltage:secondary=63000 windings=3 windings:primary=2 windings:secondary=1 phases=3 rating=20000000	This transformer intends to step up 6kV power output from a hydroelectric power plant with 2 generator units to the 63kV local power grid. It has 2 windings as primary side (connected to generators) and a single winding on the secondary side connected to consumers through power grid.
380/110 kV Trafo, Klingenbrunn	Germany	+ power=transformer location=outdoor voltage:primary=380000 voltage:secondary=110000 voltage:tertiary=20000 manufacturer=Alstom phases=3 windings=3 frequency=50	Large outdoor power transformer
		power=transformer location=outdoor	This transformer has 3 windings operating at 3 different voltages.

Die power=transformer-Seite ist deutlich länger.

„Was ist wichtig?“

Was ist wohl wichtiger, Wälder oder Transformatoren?

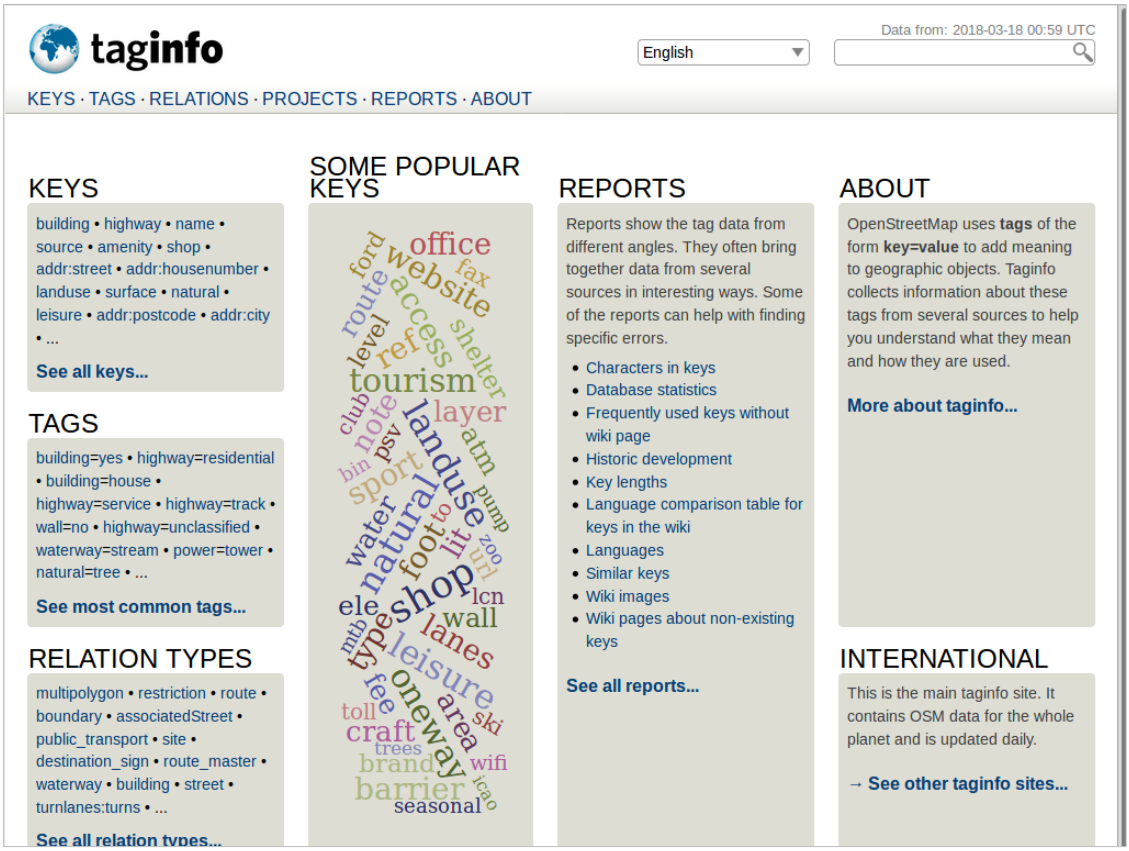


Die Zahlen scheinen klar: power=transformer gewinnt haushoch.

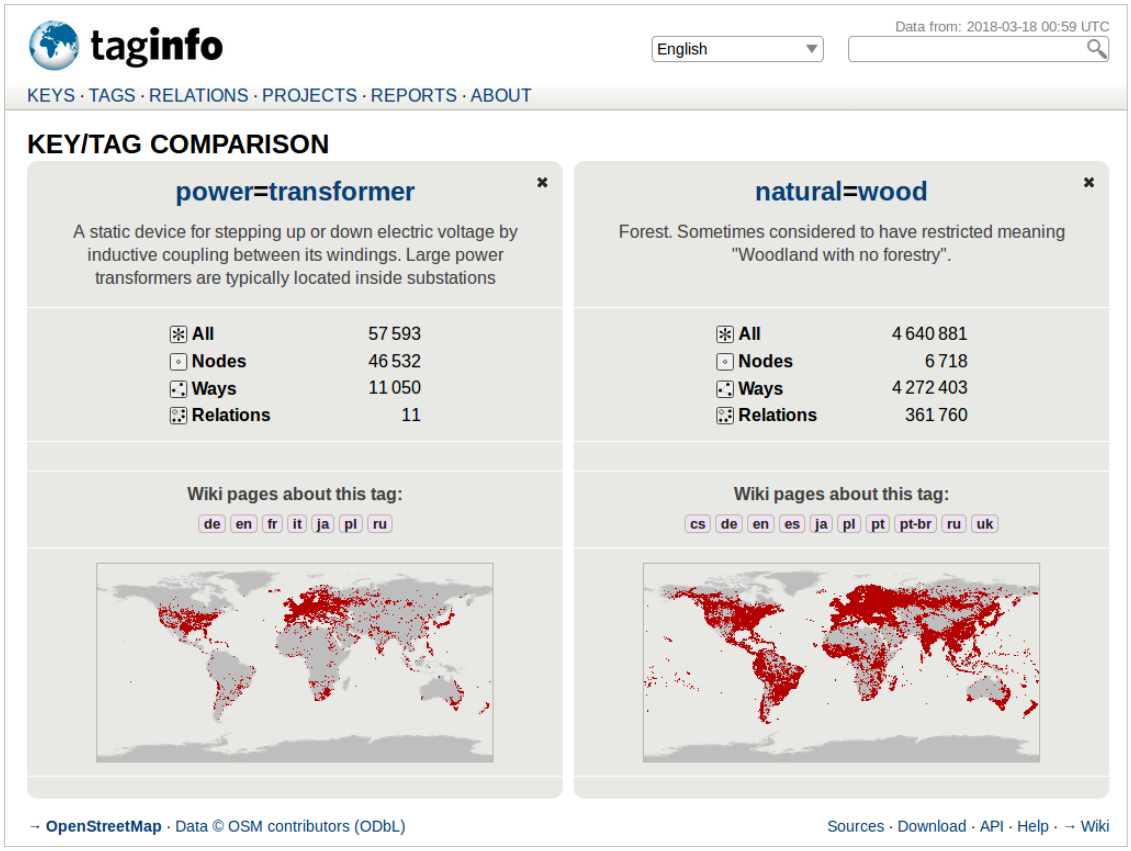
der BEWEIS:

OpenStreetMap ist ein Hort von Starkstrom-Freaks, denen ein Baum bestenfalls als Rohmaterial für Masten dient!

Provokante These!



Zum Vergleich prüfen wir die Statistikseite „taginfo.openstreetmap.org“, die es erlaubt, zu zählen, wie oft bestimmte Tags verwendet werden.



Hier wird offensichtlich, dass power=transformer wesentlich seltener ist als natural=wood.

„Was habe ich hier gerade eigentlich gezählt?“

Es ist wichtig, ab und zu innezuhalten und zu überlegen, was man gerade auswertet.

- eine Anzahl (nicht: Gesamtlänge oder Fläche)
- von OSM-Objekten (nicht: tatsächlichen Objekten)
- die ein bestimmtes Tag haben
- und aktuell im Datenbestand sind

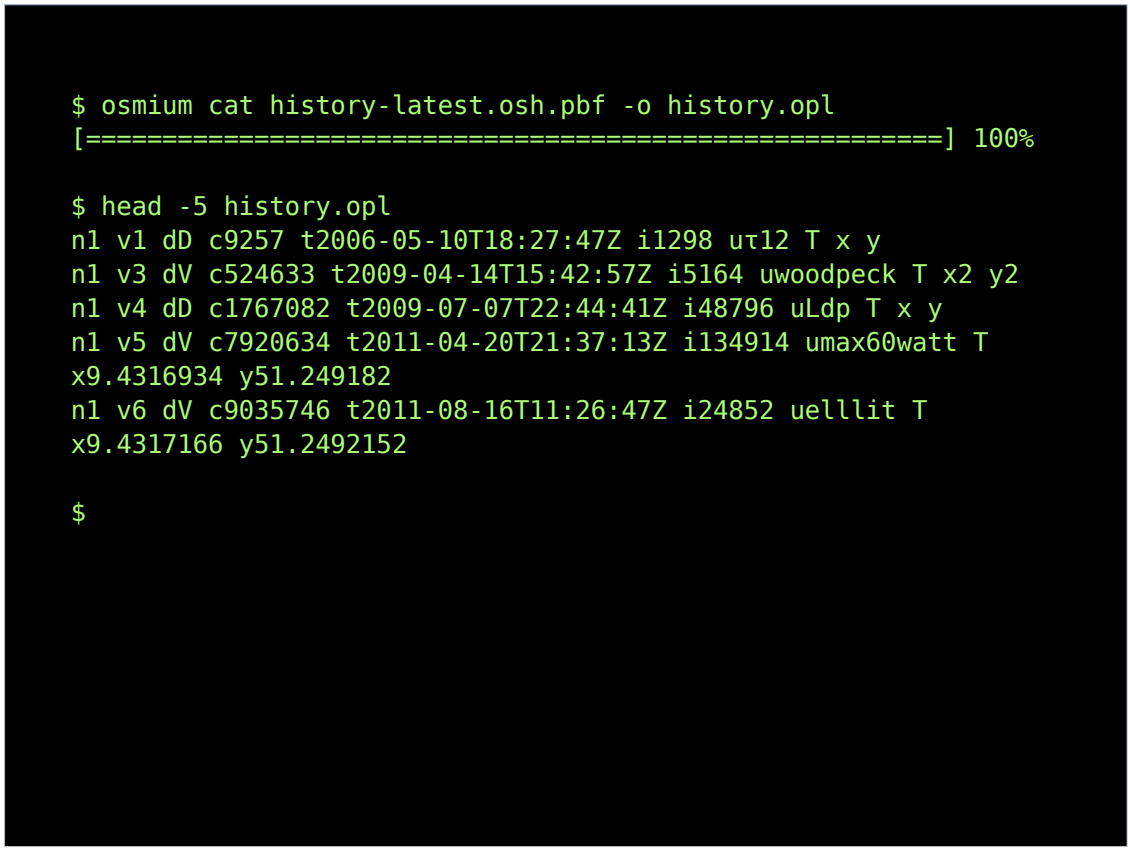
Offen: wie viele Mapper stecken dahinter?

Insbesondere beim Zählen von Straßen oder Waldflächen können sich Mißverständnisse einschleichen – etwas, das in der Reaität eine einzige Straße ist, kann bei OSM aus 10 Stücken bestehen.

```
$ osmium tags-filter -R planet.osm.pbf -o wood.opl natural=wood
[==========================================================] 100%

$ wc -l wood.opl
4640677

$ head -1 wood.opl
n262696 v4 dV c343748 t2008-06-30T12:00:55Z i6809 uTimSC_Data_
CC0_To_Andy_Allan Tname=Craigs%20%Wood,natural=wood,created_by
=Potlatch%20%0.5d x-0.7375861 y51.1050004

$ cut -d\  -f7 wood.opl | sort -u | wc -l
35114

$ cut -d\  -f7 wood.opl | sort | uniq -c | sort -rn | head -5
  70058 uCanvecImports
  67422 uGIShulyak
  56915 uAmateurCartographer_import
  52904 uMilos%20%Cekovic
  50887 umrsid_linz
```

Mit „Osmium“ wird aus einer OSM-Datei ein Extrakt aller Waldgebiete erstellt und als .opl („object per line“)-Textdatei abgespeichert. Diese läßt sich leicht mit Unix-Commandline-Tools bearbeiten, z.B. die Anzahl verschiedener User oder eine nach Anzahl Edits sortierte Liste von Mapper kann erzeugt werden.

Dabei ist aber zu beachten, dass der Mapper, der ein Objekt zuletzt angefasst hat, nicht unbedingt der ist, der den „Wald“ auch als erster eingetragen hat; jemand könnte lediglich einen existierenden Wald leicht verändert haben, ohne überhaupt viel von Wäldern zu wissen.



Um die Frage „wie viele Mapper haben denn einen Wald initial hinzugefügt“ zu beantworten, wird jetzt ein „full history“-File herangezogen, das sämtliche Versionen jedes Objekts enthält. Hier sieht man verschiedene Versionen des Nodes Nr. 1, die von verschiedenen Mappern bearbeitet wurden.

```
#!/usr/bin/perl

use strict;
my $last;

while(<>)
{
    my @bits = split(/ /, $_);
    my $obj = shift(@bits);
    my %part = map { substr($_,0,1) => substr($_,1) } @bits;
    my %tag = map {/(.*)=(.*)/; $1=>$2 } split(/,/, $part{'T'});
    if (($tag{'natural'} eq 'wood') && ($obj ne $last)) {
        print $part{'u'}."\n";
        $last = $obj;
    }
}
```

Die Analyse erfordert etwas Programmcode, hier im Beispiel ein Perl-Skript, das einen Benutzernamen immer dann ausgibt, wenn das Objekt ein natural=wood-Tag hat und vorher noch nicht ausgegeben wurde.

```
$ perl filter.pl < history.opl | sort -u | wc -l
30412  (vorher: 35114)

$ perl filter.pl < history.opl | sort | uniq -c | sort -rn |
head -5
  74181 GIShulyak
  73377 CanvecImports
  63290 mrsid_linz
  58918 AmateurCartographer_import
  55137 Milos%20%Cekovic

$ perl filter.pl < history.opl | sort -u |
grep -v "^      [1-4]" | wc -l
14546
```

Die Anzahl der „Wald-Hinzufüger“ ist rund 30.000, also etwas kleiner als die Anzahl der „Wald-Zuletzt-Verä,nderer“. Um Zufalls- oder unbeabsichtigte Änderungen auszuschließen (z.B. das objektunabhängige Reparieren von Polygonen), ignorieren wir alle Benutzer mit unter 5 Edits.

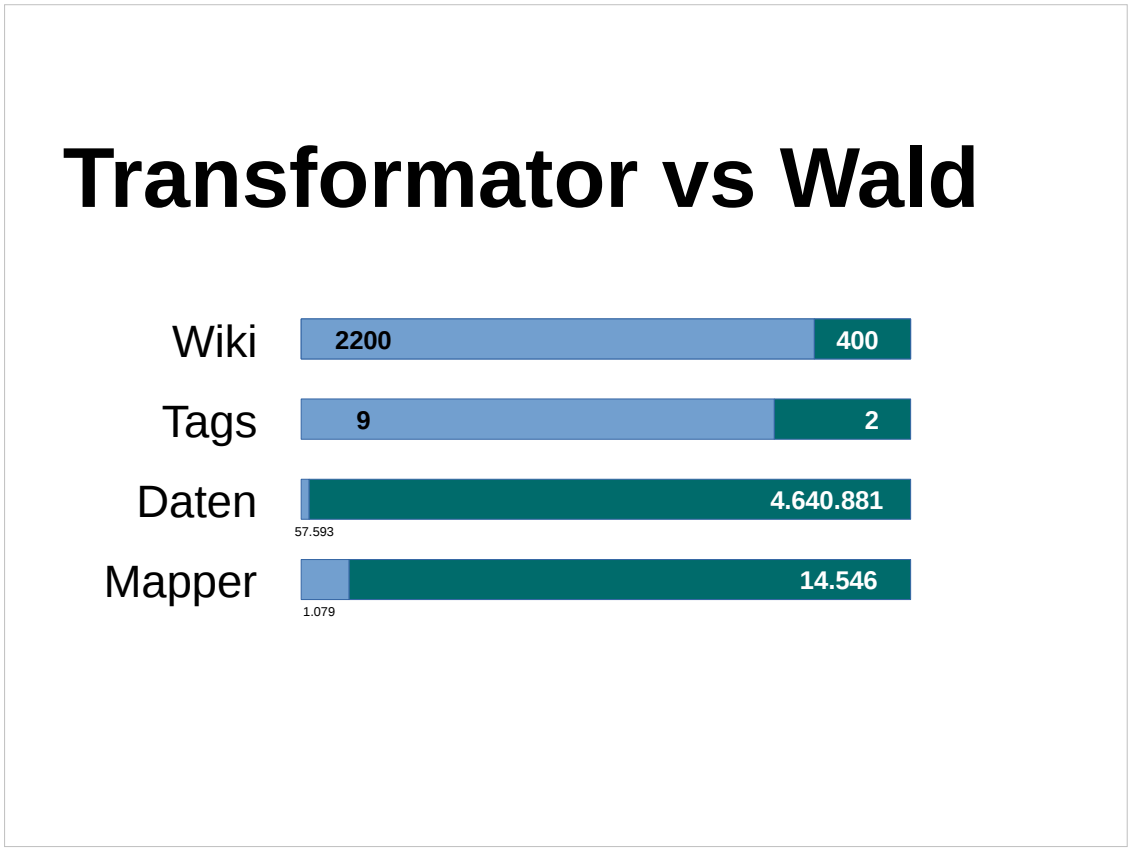
- eine Anzahl
- von Personen
- die ein bestimmtes Tag erstmalig einem Objekt hinzugefügt (oder ein Objekt mit diesem Tag erstellt) haben
- die Objekte können inzwischen gelöscht sein

Offen: Wege teilen, Geometrie ändern; daher Benutzer mit < 5 Edits nicht gezählt

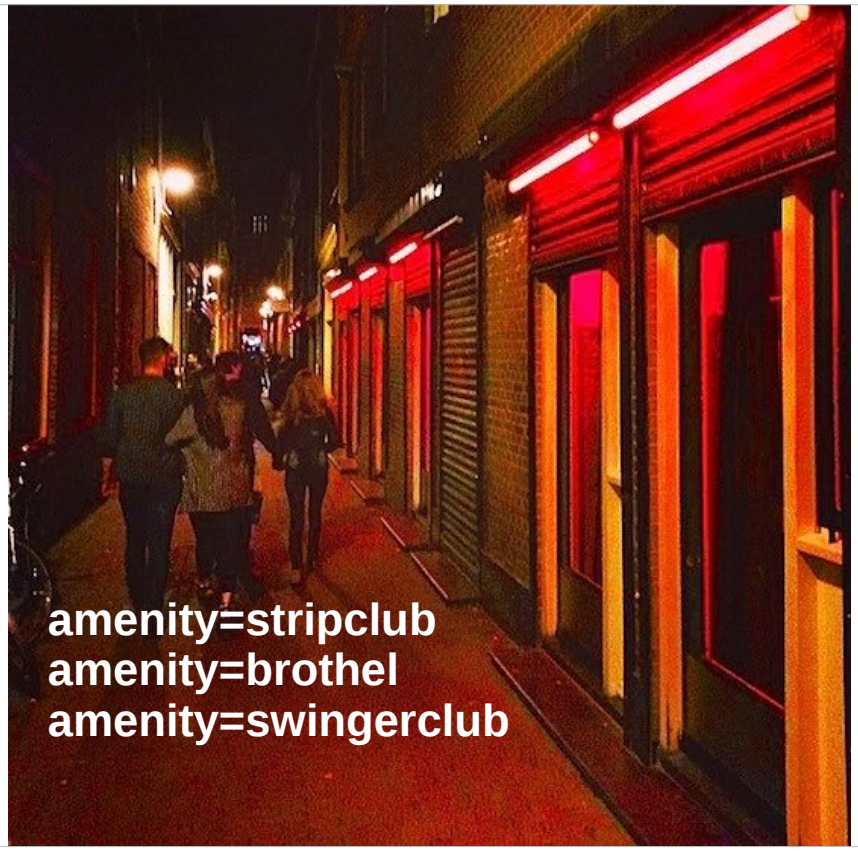
Gezählt wurde also diesmal, wieviele Personen etwas hinzugefügt haben.

```
#include <iostream>
#include <osmium/io/any_input.hpp>
#include <osmium/handler.hpp>
#include <osmium/visitor.hpp>

class TagHandler : public osmium::handler::Handler {
    osmium::object_id_type lid = 0;

public:
    void osm_object(const osmium::OSMObject& object) {
        if (object.tags().has_tag("natural", "wood")) {
            if (lid != object.id()) {
                lid = object.id();
                std::cout << object.user() << std::endl;
            }
        }
    }

};

int main(int argc, char* argv[]) {
    TagHandler handler;
    osmium::io::Reader reader{argv[1]};
    osmium::apply(reader, handler);
}
```

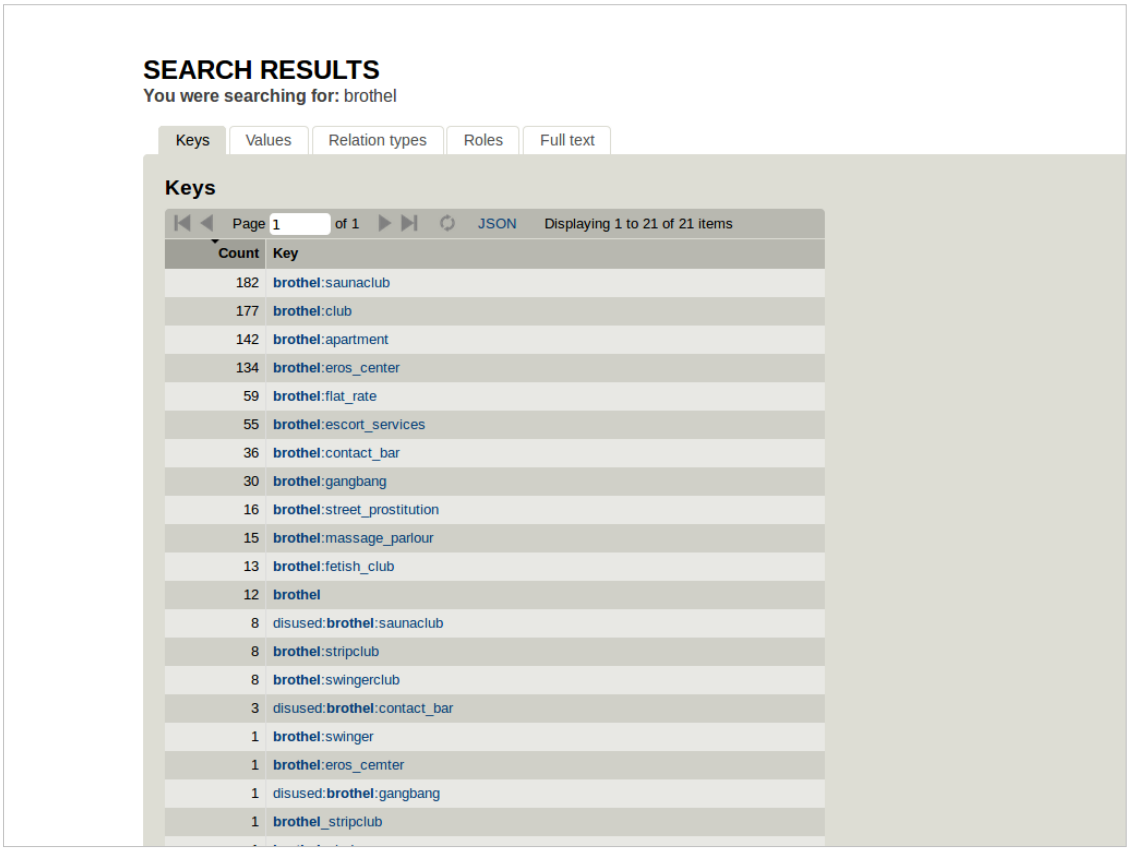
Beispiel eines C++-Programms mit der „Osmium“-Bibliothek. Es leistet das gleiche wie das Perl-Skript, kann jedoch direkt .osh.pbf-Dateien lesen und ist deutlich schneller.



Übersicht über die Ergebnisse zu Transformatoren und Wald.



Eigentlich geht es aber um Sex. Immer wieder wird behauptet, das (unzweifelhafte) Übermaß männlicher Mapper bei OpenStreetMap schlage sich in einer verzerrten Sichtweise nieder. Oft wird, um dies zu untermauern, ein Vergleich zwischen Prostitution und Kinderbetreuung in OSM gezogen.



SEARCH RESULTS

You were searching for: brothel

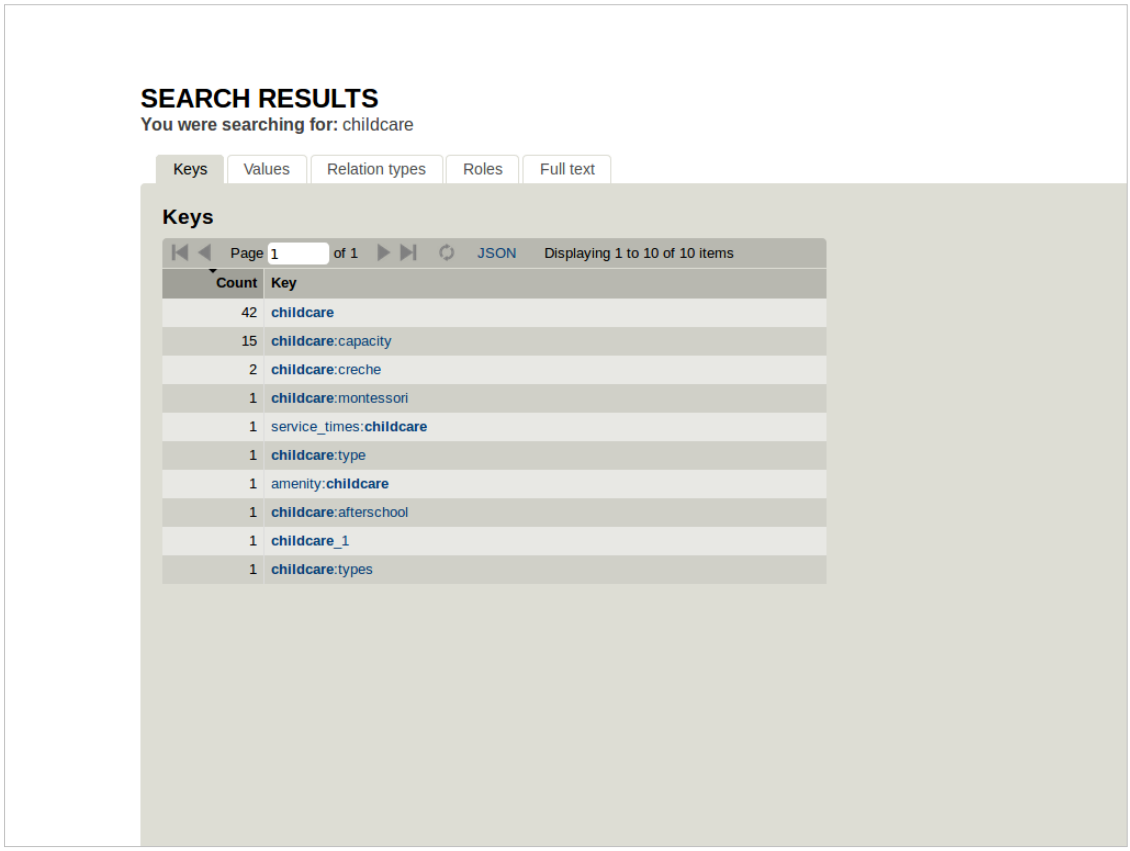
Keys | Values | Relation types | Roles | Full text

Keys

Page 1 of 1 JSON Displaying 1 to 21 of 21 items

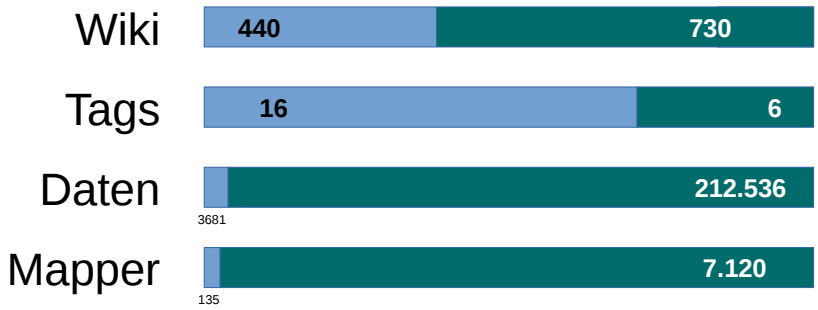
Count	Key
182	**brothel**:saunaclub
177	**brothel**:club
142	**brothel**:apartment
134	**brothel**:eros_center
59	**brothel**:flat_rate
55	**brothel**:escort_services
36	**brothel**:contact_bar
30	**brothel**:gangbang
16	**brothel**:street_prostitution
15	**brothel**:massage_parlour
13	**brothel**:fetish_club
12	**brothel**
8	disused:**brothel**:saunaclub
8	**brothel**:stripclub
8	**brothel**:swingerclub
3	disused:**brothel**:contact_bar
1	**brothel**:swinger
1	**brothel**:eros_cemter
1	disused:**brothel**:gangbang
1	**brothel**_stripclub

Wer unbedarft „brothel“ (Bordell) bei „taginfo“ eingibt, erhält den Eindruck, dass hier wesentlich mehr Detail aufgezeichnet wird als beispielsweise bei...



„childcare“ (Kinderbetreeung).

Sex vs. Kindergärten



(903 von 1024 Bordellen mit „Spezialtags“ stammen vom gleichen Mapper, nur 9 Personen haben mehr als 2x ein Spezialtag benutzt.)

Ein Vergleich der Anzahl und Dokumentation von amenity=brothel/stripclub/swingerclub mit amenity=kindergarten/childcare zeigt aber, dass Kindergärten und Menschen, die sie mappen, bei weitem überwiegen.

Unter 83.025 Ärzten in OSM sind nur 1.033 Frauenärzte!

Stimmt, aber nur bei 18.728 Ärzten ist überhaupt eine Fachrichtung angegeben, und „Frauenarzt“ ist nach „Allgemeinarzt“ die häufigste (mit 5,52%).

F = Frauenärzte
A = Augenärzte
K = Kinderärzte
I = Internisten

Unter 205.469 Toiletten in OSM sind nur 8.534 Damentoiletten!

Stimmt, aber auch nur 8.684 Herrentoiletten, die anderen haben keine Angabe oder sind (16.222) „unisex“.

Danke

Frederik Ramm <frederik@remote.org>