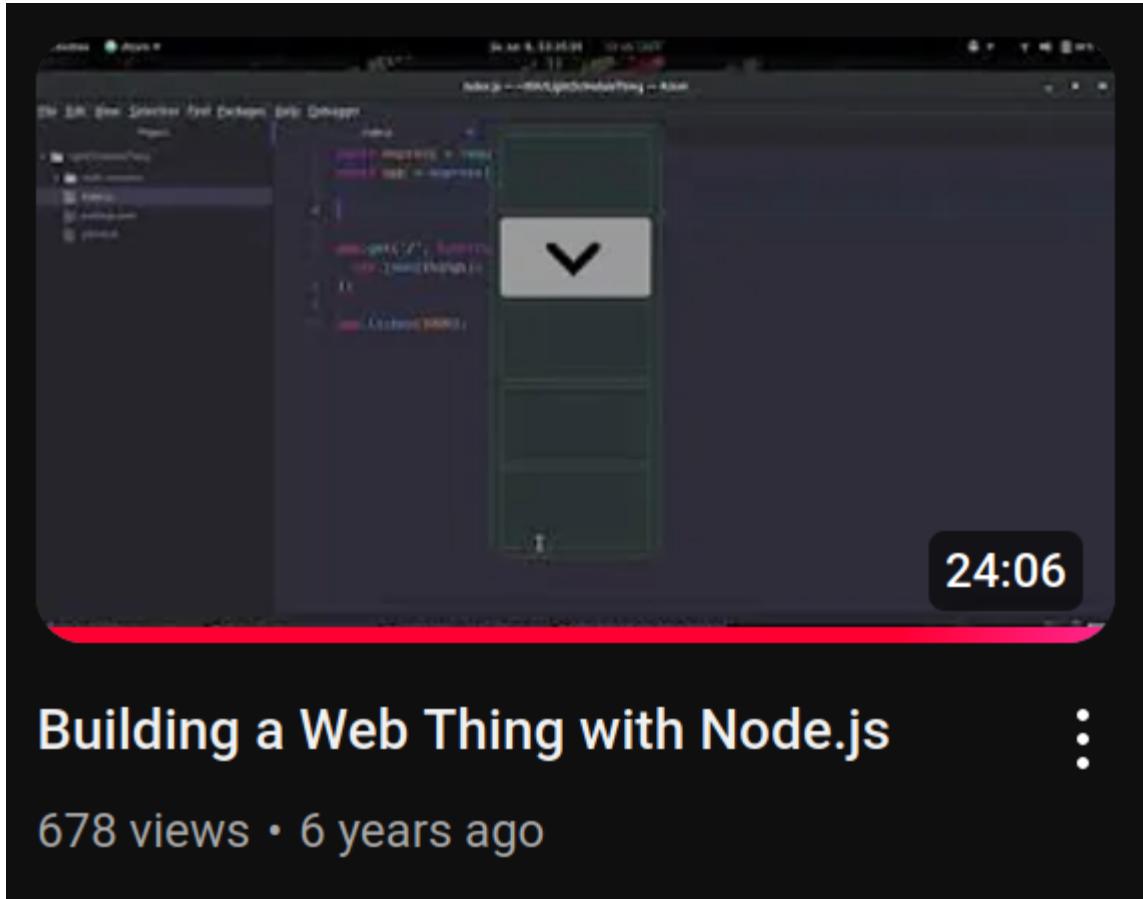


# **WOT FOR EVERY THING**

by Christian 'Jaller' Paul

on 2024-11-14

What are the limits of IoT?



My WoT journey started building things with Express.js, e.g. a countdown and a virtual lamp. I even recorded a tutorial about it.

# BUILDING A THING SERVER

1. Define the server
2. Define the Things
3. Let the server expose the things

But what if there are too many Things you want to represent? It would be too much for your CPU, storage, RAM and network to handle them all simultaneously.

# A WebThing for every OpenStreetMap element (Ideation phase)

WebThings



jaller94 Christian Paul

May '19

May 2019

For the last few days I have been building an express-based web server to make every Point of Interest a WebThing. This way you can use the opening hours of your library, the happy hours of your favourite restaurant or the sun's position at a place close to your heart for home automation.

I am planning to host a flagship server, but you may run the server yourself.



[WebThings / webthing-osm](#)

WebThings for Points of Interest in OpenStreetMap

1 / 4

May 2019

You can contact me here or on Mastodon where I occasionally post about the project:  
<https://mastodonten.de/@jaller94/102070817594414594> 2

May 2019

If you like the project, tell me what values related to OpenStreetMap or WikiData you would like to use for home automation or help me with open issues I still have to address before a 1.0 release.

3

created

May '19

last reply

May '19

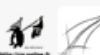
3

547

3

3

1



v



OpenStreetMap

Edit

History

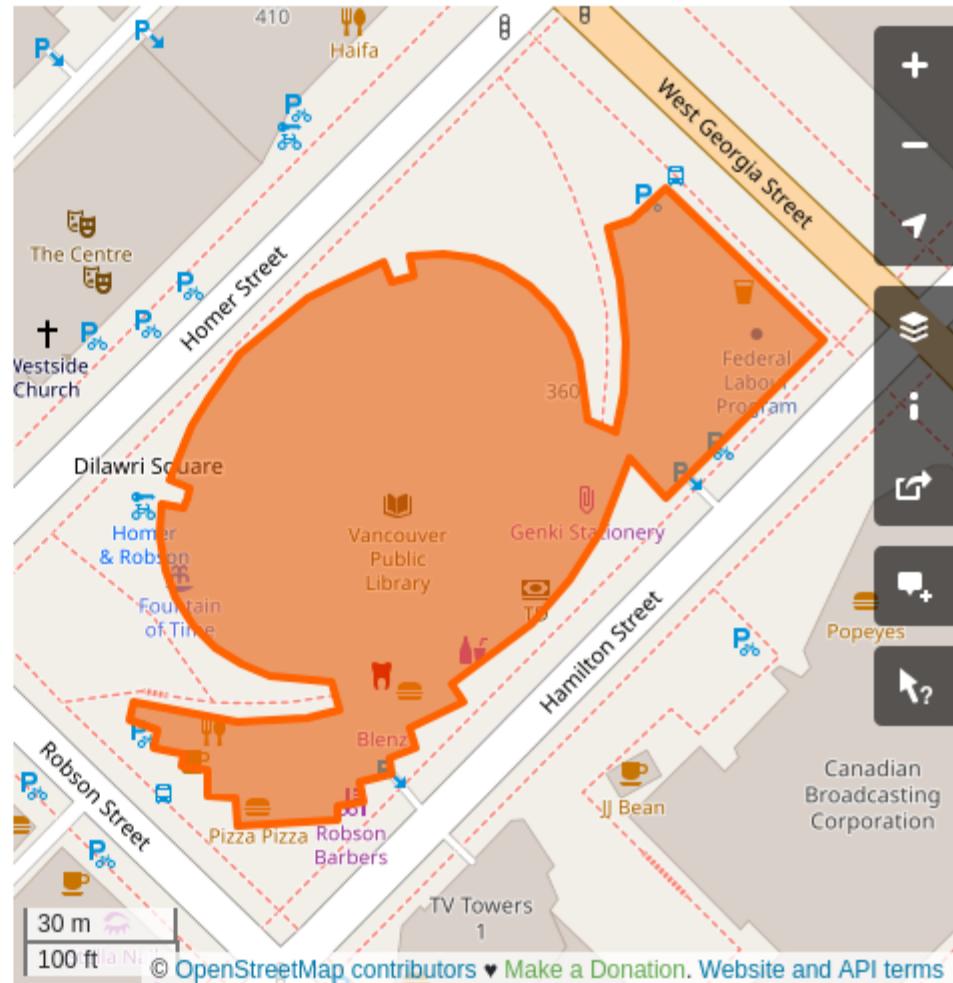
Export

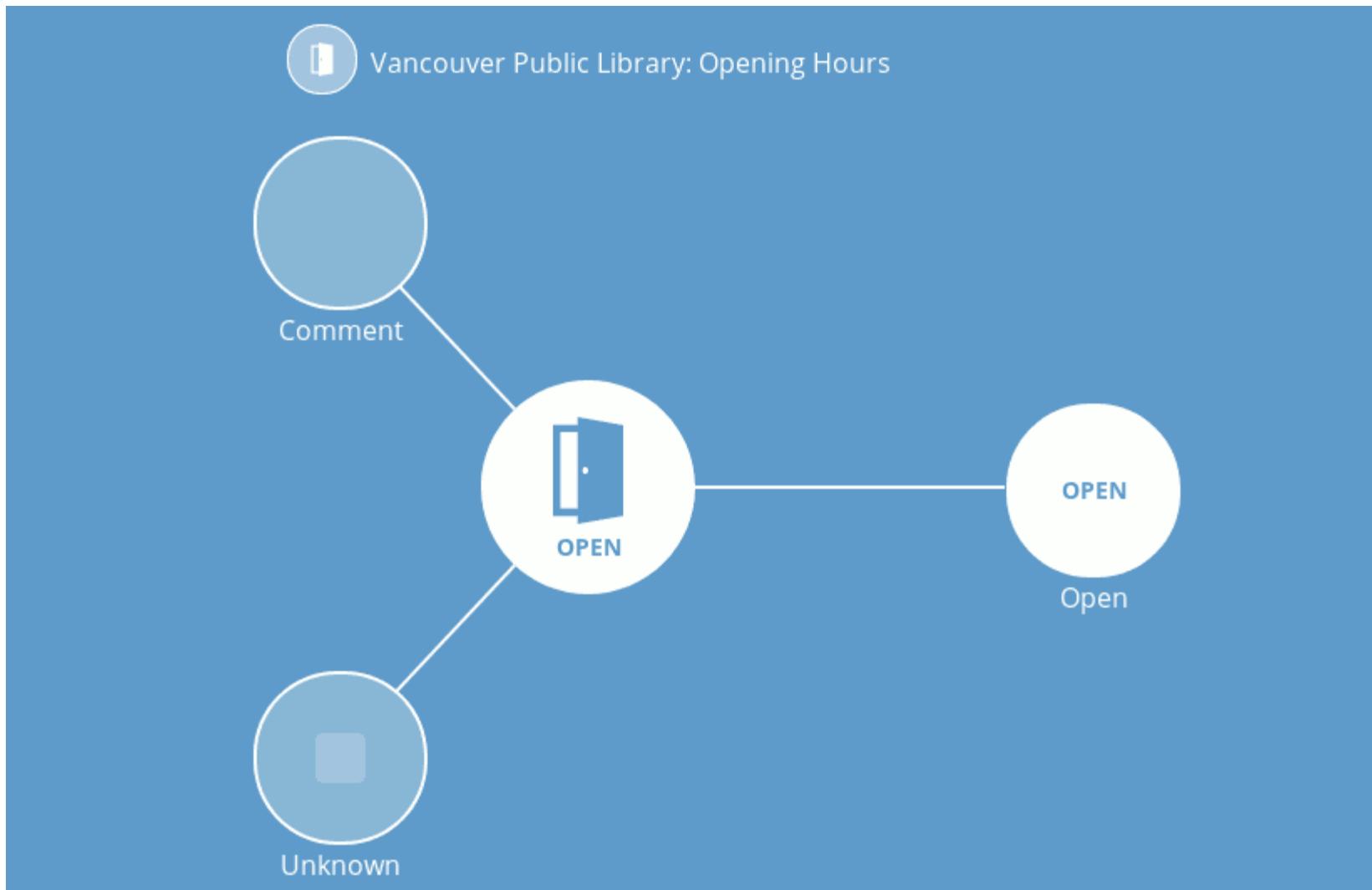
More



Jaller

building	yes
building:facade:color	#927d68
check_date:opening_hours	2023-10-29
internet_access	wlan
name	Vancouver Public Library
name:ko	밴쿠버 공립 도서관
opening_hours	Mo-Th 09:30-20:30; Fr 09:30-18:00; Sa 10:00-18:00; Su 11:00-18:00
operator	Vancouver Public Library
operator:short	VPL
operator:type	public
operator:wikidata	Q1376408





# BUILDING A DYNAMIC THING SERVER

1. Define the server
2. Start the server
3. Initialize Things on demand

Vancouver Public Library:  
[/osm/opening-hours/way/37111640](https://osm.opening-hours.info/way/37111640)

- osm - My application ID (osm = OpenStreetMap)
- opening-hours - A sub-application ID
- way - OpenStreetMap type
- 37111640 - The way ID of the library on OSM

# **WHEN A NEW ELEMENT GETS REQUESTED**

1. Fetch element on OpenStreetMap
2. Resolve address to a timezone
3. Fetch the local holiday days
4. Parse the opening\_hours string
5. Set timeouts for when the place opens / closes



## WoT Anything

An extensible Thing server with on demand  
initialisation of Things



City bike station:  
[/youbikes/501202040](https://youbikes.com/station/501202040)

See a YouBike station in Taiwan:

<https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/youbikes/501202040>

WoT Anything matches the API operations

- getDescription
- getProperty (= readproperty)
- getPropertyEventEmitter (= observeproperty)
- getAllProperties (= readallproperties)
- etc.

In summer, I got my hands on professional lighting equipment. It uses the IP-based Art-Net protocol which I translated to WoT.

Art-Net universe:  
[/art-net/1](http://art-net/1)

See an Art-Net universe with 512 channels:  
<https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/art-net/1>

Art-Net channels:  
`/art-net/1-19-10`

universe **1**  
starting with channel **19**  
a total of **10** channels

See an Art-Net channel range:

<https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/art-net/1-19-10>



MH-x30 LED Beam Moving Head  
(no advertisement, just the lamp I had available for  
testing)

Art-Net for an MH-x30 LED Beam in its 10 channel mode:

/art-net/1-19-mh-x30-led-beam-10

We replaced the trailing "-10" with a product name for meaningful property names.

See an Art-Net range for a specific LED beam:  
<https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/art-net/1-19-mh-x30-led-beam-10>

Note, all three Art-Net Things you just tried, share some or all channels. The mapping is performed by the WoT Anything server.



WoT Wrench

A web app to test and debug Things. It's a consumer.

See it generate some UI for these virtual Things:

<https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/test-property-types/basics-ro> <https://wot-wrench.chrpaul.de/#try=https://wot.chrpaul.de/test-property-types/base64-media-ro>

The Godot game engine supports HTTP requests and Websockets, so it's possible to integrate WoT into games.

What are the limits of IoT?

# AVAILABLE FEATURES

- HTTP
- Server-Sent-Events (SSE)
- Websockets
- Getting, setting and observing Properties
- Invoking synchronous Actions
- Basic types
- Nullable Properties
- Base64-encoded media

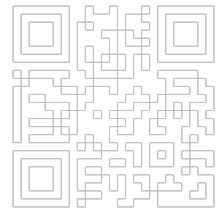
# INCOMPLETE FEATURE WISHLIST

- Optimistic UI
- Observing Events
- Async Actions
- Input selector
- uriVariables
- Languages
- Thing Models
- JSON-LD
- Tests for everything
- Documentation for everything
- Security mechanisms

# HOW TO SUPPORT ME?

- Provide mentorship for self-employment
- Hire me to work on these projects
- Help with the UX design
- Send me your things (TDs, URLs)
- Talk to me online or at WoT Week in November 2024

# THANK YOU FOR YOUR ATTENTION!



[chrpaul.de/about](http://chrpaul.de/about)