



Easily publish your QGIS projects on the web with QWC2

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SOURCEPOLE
Linux & Open Source Solutions



› QGIS

- › 4 C++ Core Developers
- › QGIS Enterprise (Maintenance and Support)
- › KADAS Albireo

› Web-GIS

- › QGIS Web Client 2



- › QGIS Cloud SDI - qgiscloud.com





Outline

- Introduction to QWC2
- Introduction to qwc-services
- Feature showcase
- News from the project



QGIS Web Client 2

- **QWC2 is the official web application for publishing QGIS projects on the web**
 - First public release in 2016
 - Modern, responsive UI
 - Plugin architecture, easily extensible
 - State of the art technologies: ReactJS, OpenLayers 7





OGIS Web Client 2

The screenshot displays the QWC Demo web client interface. At the top, there is a search bar with the text "Search place or add map..." and a "QWC Demo" logo. Below the search bar, a "Toggle API demo" button is visible. The main area is a map of Europe with a dark background and orange outlines. On the right side, there is a "Layers & Legend" panel with a list of layers: "Demo", "Edit Demo", "Edit Points", "Edit Lines", "Edit Polygons", "Geographic lines", "Country names", "States and Provinces", and "Countries". Each layer has a checkbox and a trash icon. Below the layers list, there are options for "Show layer map tips", "Compare top layer", and "Import layer". At the bottom of the map, there is a status bar showing "Coordinates: 1929481 5892447", "WGS 84 / Pseudo Mercator", and "Scale: 1 : 25000000".

On the left side, there is a sidebar menu with the following items: "Filter menu...", "Theme", "Layers & Legend", "Layer catalog", "Share Link", "Bookmarks", "Map Tools", "Print", "Help", and "Login".

At the bottom left, there is a scale bar for 500 km and a "QWC2 Demo | Terms of use" link.



OGIS Web Client 2 - Core features

- Theme switcher (OGIS projects)
- Layertree
- Feature Info
- Search with configurable providers
- Measurement tools
- Redlining (sketching)
- Permalink sharing
- Geolocation
- PDF printing
- Map compare
- Importing external layers (WMS, WFS, WMTS, KML)
- Javascript API



QGIS Web Client 2

- QWC2 as simple WMS Client on top of QGIS Server
 - Static JS/HTML/CSS application
 - Limited to functionality provided by QGIS Server





- **Microservices for extending QWC2**
 - Collection of loosely-coupled services
 - Communication over HTTP/REST
 - Mostly Python-Flask services
- **Easily deployed as Docker containers**
 - <https://github.com/qwc-services/qwc-docker>
- **Or custom setup, i.e. via Apache + mod WSGI**

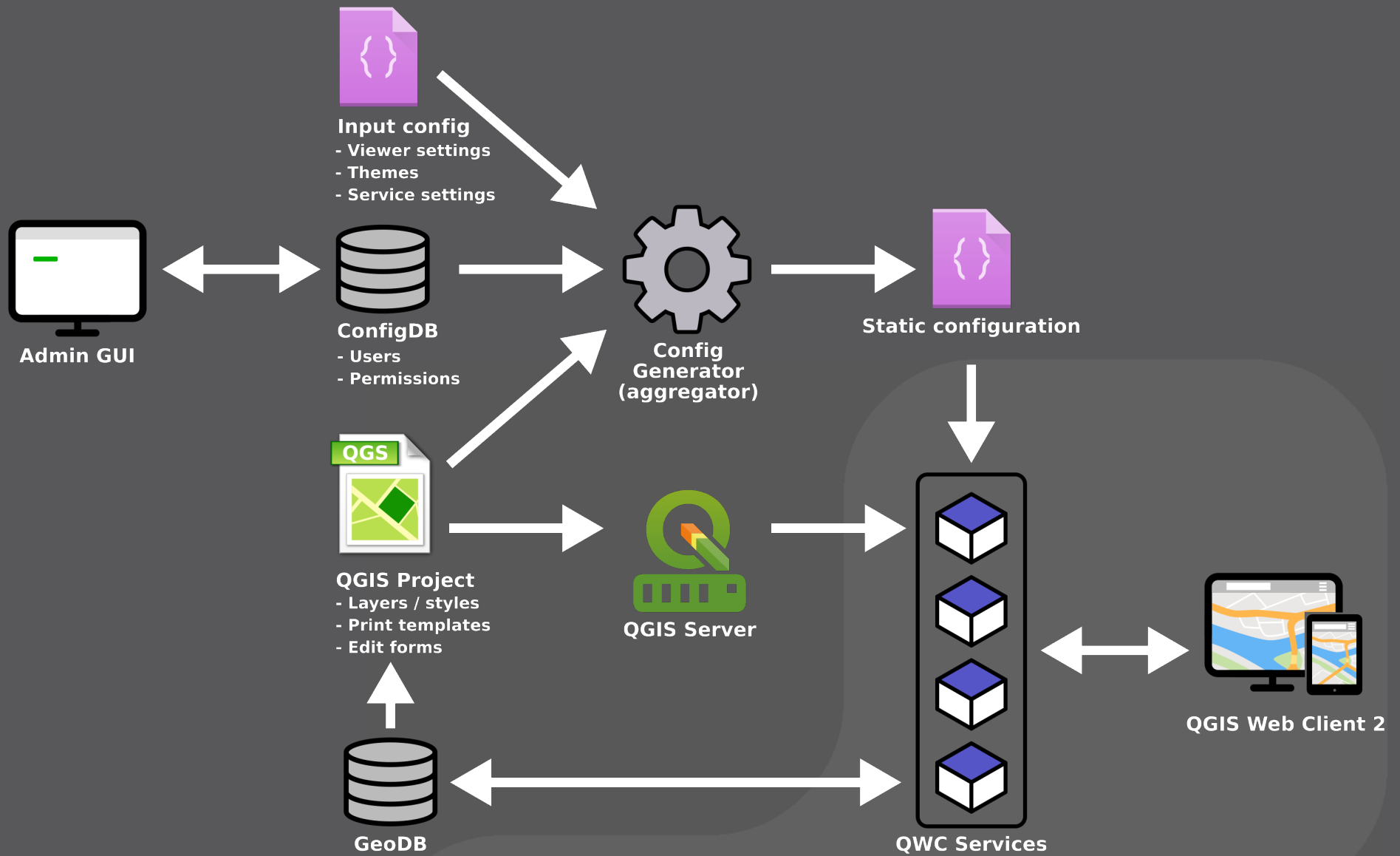


qwc-services · Extended features

- **Functionalities available by extending QWC2 with qwc-services**
 - User and resource management
 - Multi-tenancy
 - Authentication
 - Fulltext search
 - Editing
 - Compact permalinks, user bookmarks
 - Height profile
 - Custom feature-info templates
 - Reporting (Jasper)
 - Mapinfo popup



qwc-services - Architecture





qwc-services · Core services

- **QWC OGC service**
 - Forwards requests to QGIS server enforcing permissions
- **QWC map viewer**
 - Enforces permissions to the QWC2 themes and viewer configuration
- **QWC Admin GUI**
 - Backend for managing users and resource permissions (maps, layers, edit datasets, ...)
- **QWC Config Generator**
 - Aggregates theme config and permissions into static service configuration files

› QWC Data Service

- › Allows read/write access to configured datasets in a PostGIS DB
- › Backend for the QWC2 editing functionality

› QWC Permalink Service

- › Stores and resolves compact permalinks

› QWC Fulltext Search Service

- › Faceted fulltext search with Apache Solr



qwc-services · Authentication

- **Modular authentication services**
 - Issue JWT tokens
- **QWC DB Auth**
 - Authentication against user DB
- **QWC LDAP Auth**
 - Authentication with LDAP/Active Directory
- **and others (i.e. Kerberos, SAML)**



Docker / Kubernetes

› Docker

- › One service per container
- › Execution in controlled environment
- › Easy to create and manage
- › Distribution over centralized registry
- › <https://www.docker.com/>

› Kubernetes

- › System for automating the deployment, scaling and management of container applications
- › <https://kubernetes.io/>



QWC2 feature showcase



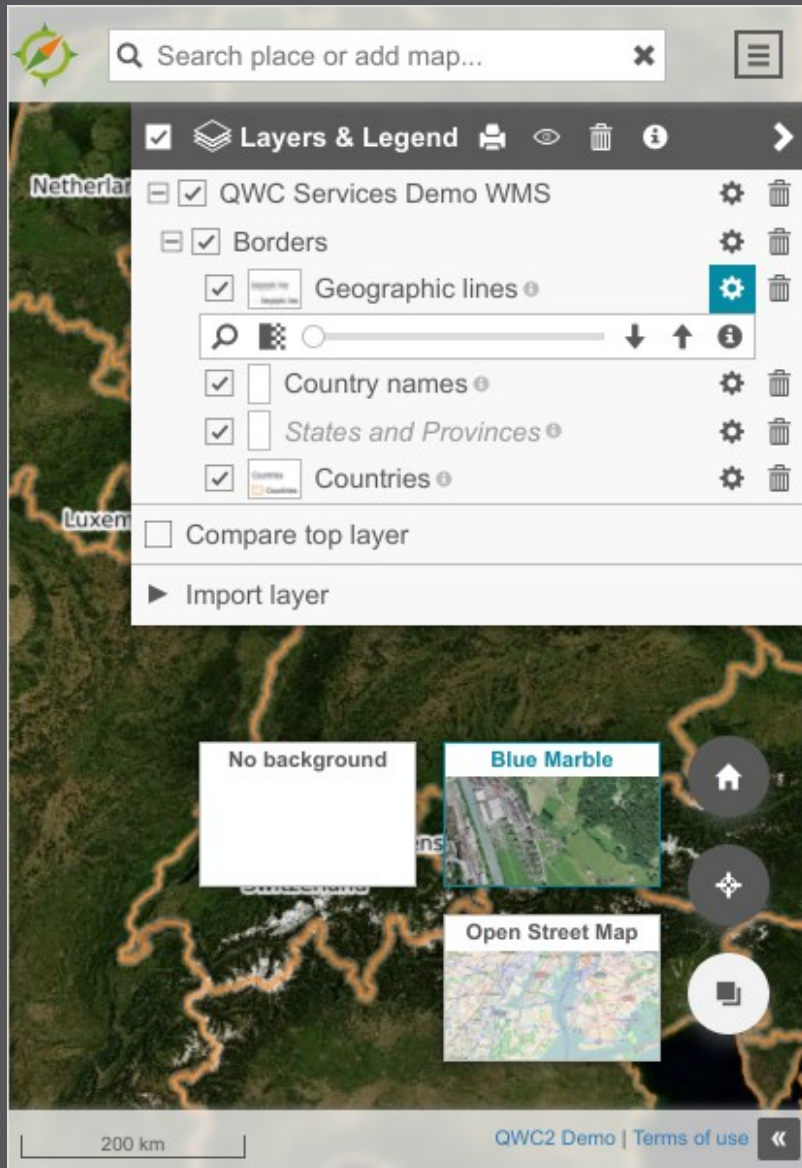
QWC2 Features - Theme Switcher



- A theme corresponds to a published QGIS Project



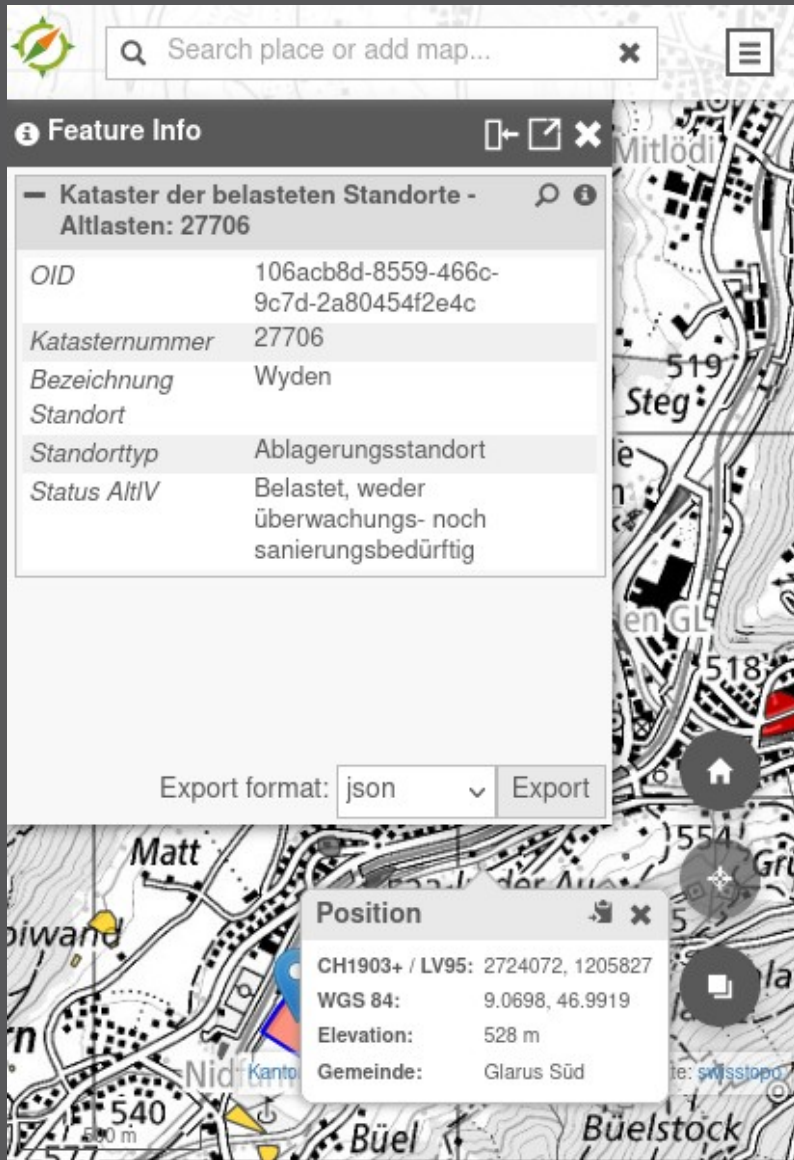
QWC2 Features - Layer Tree



- Visibility / transparency
- Reorder layers
- Import external layers
 - WMS/WMTS/WFS/KML/GeoJSON
- Compare top layer
- Background layer switcher



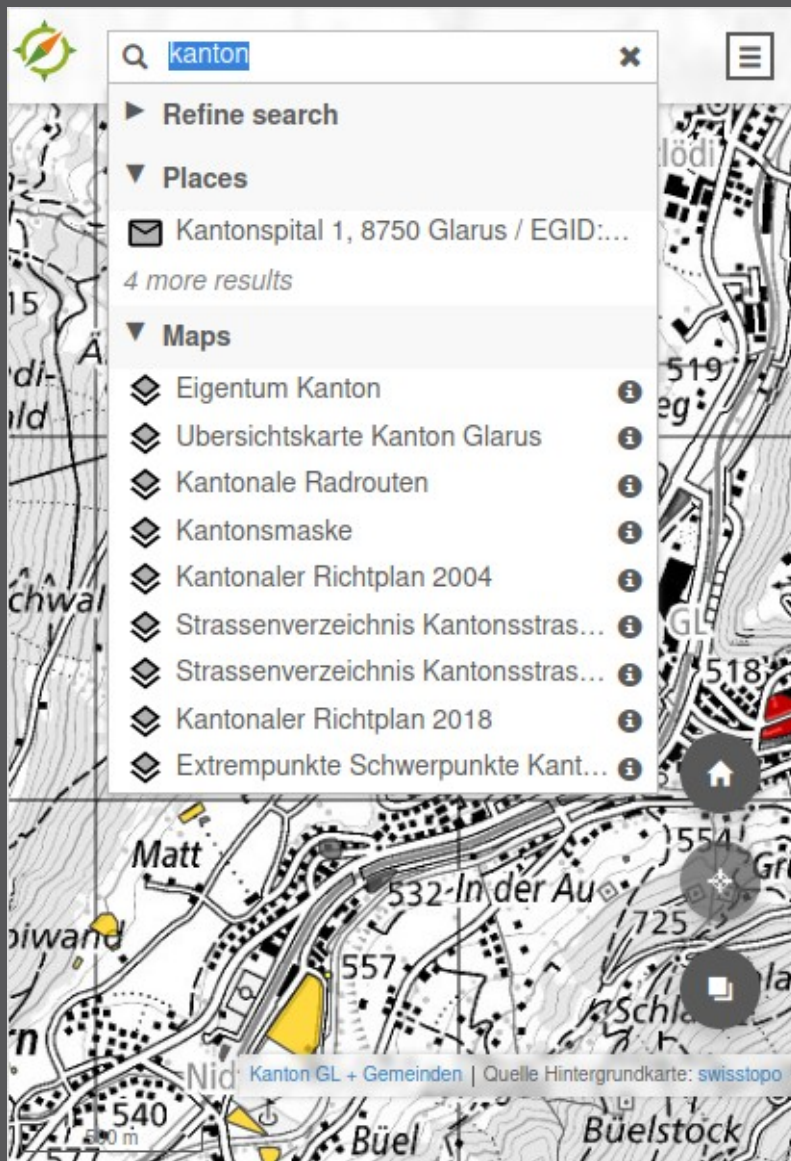
OWC2 Features - Feature & Map Info



- Info for selected feature
 - WMS GetFeatureInfo
- Info for selected position
 - Position, elevation
 - Custom information



OWC2 Features - Search

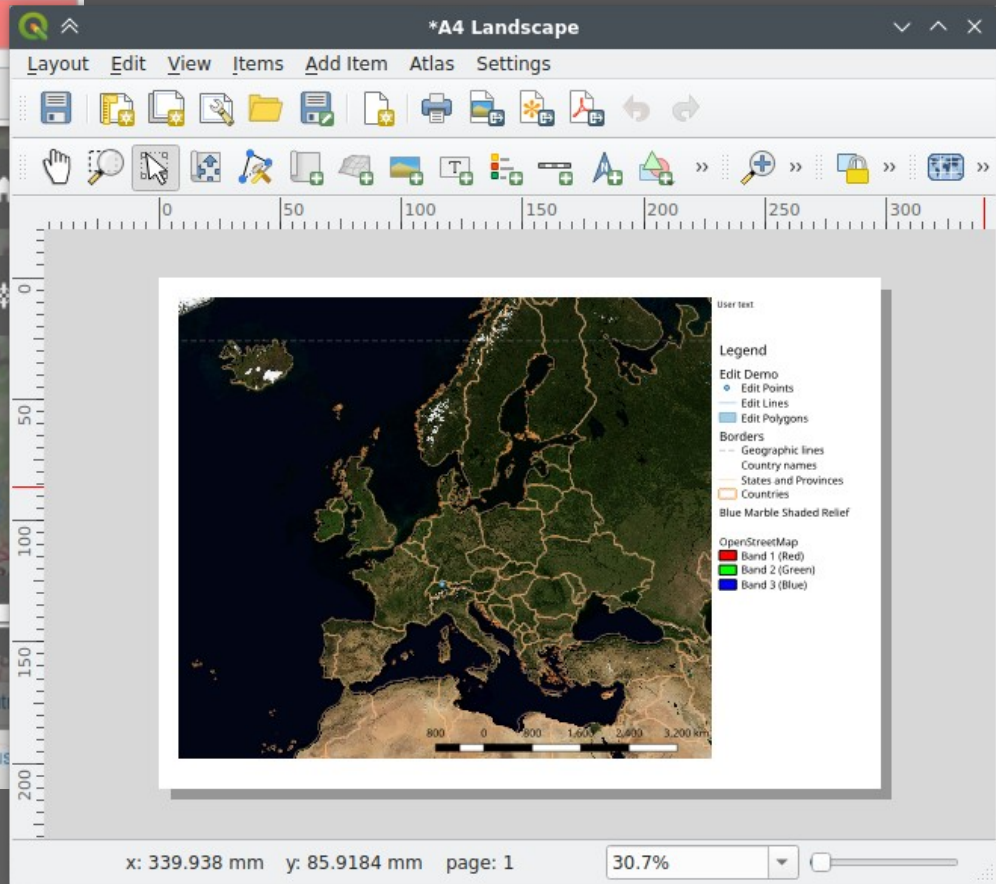
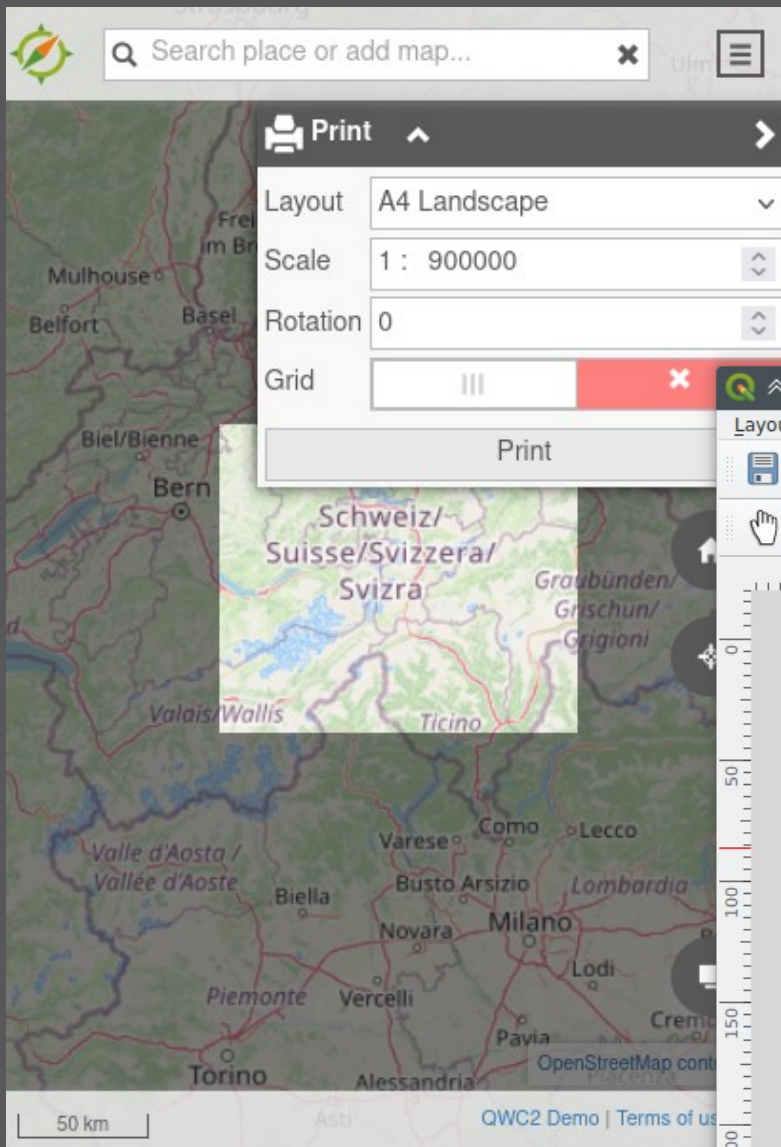


- Search with configurable providers
 - Places
 - Layers/Map
 - Themes



QWC2 Features - Printing

- QGIS Server WMS GetPrint
- QGIS Print Layouts





QWC2 Features - Redlining & Measure

Search place or add map...

Layer Draw Edit

Redlining + [Tools]

Border: - 2 + Label

Color palette: 0693E3

Map: Valais/Wallis, Schweiz/Svizzera/Svizra

Scale: 50 km

QWC2 Demo | Terms of use

Search place or add map...

Position Length Area Bearing

268.27 km Metric

Map: Valais/Wallis, Schweiz/Svizzera/Svizra

Measurement: 164.95 km, 103.32 km

Pop-up: Distance: 142720 m, Height: 3087 m a.s.l.

Profile: Height [m a.s.l.] vs Distance [m]

Scale: 50 km

QWC2 Demo | Terms of use



QWC2 Features - Editing

The screenshot shows the QGIS editing interface. On the left, the 'animals - Feature Attributes' dialog is open, showing fields for Animal (Cat), name (Mily), age (4), gender (Female), weight (5), and picture (2ff0-15af-11ee-8751-c9fd60e96f4e.jpg). Below these fields are 'OK' and 'Cancel' buttons. On the right, the 'Editing' panel is visible, showing the 'Pick' tool selected and the 'Fluffy animals' layer. The 'Basic' tab is active, displaying the same fields as the dialog. A 'picture' field contains a thumbnail of a cat. At the bottom, the 'lastedit' field shows the date and time '06/04/2019 01:28:09'. The status bar at the bottom indicates '1903+ / LV95' and 'Scale: 1 : 4000'.

➤ Edit geometry and attributes

- QGIS edit forms
- File uploads
- Key-value relations
- 1:N relations

➤ Attribute table

- Geometryless datasets

The screenshot shows the 'Attribute Table' window for the 'Fluffy animals' layer. The table has the following columns: id, name, age, birthdate, size, hungry, sleepy, remarks, Animal, and picture. The data is as follows:

id	name	age	birthdate	size	hungry	sleepy	remarks	Animal	picture
2	Minni	0	04/25/2011	5	<input type="checkbox"/>	<input type="checkbox"/>		Cat	minni.jpg
1	Mily	2	02/13/2019	6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Selec	11.jpg
3	asd	1	mm/dd/yyyy	6	<input type="checkbox"/>	<input type="checkbox"/>		Cat	Browse...

The table is displayed with a 'Layer' dropdown set to 'Fluffy animals'. The 'id' column is selected, and the table is showing 50 items per page.



QWC2 Features - Admin backend

Home Users Groups Roles Resources Permissions Registration Logout

Permissions

[+ New Permission](#) Role Filter: All Type Filter: All Search

< 1 2 >

ID	Role	Resource type	Resource	Priority	Write		
31	admin	Attribute	Long name (<i>countries</i>)	0	False	Edit	Remove
32	admin	FeatureInfo layer	Orthofoto_2015_stdzh_0.5_jpeg (<i>test1</i>)	0	False	Edit	Remove
8	public	Data	animal_names (<i>test1</i>)	0	False	Edit	Remove
6	public	Data	animals (<i>test1</i>)	0	True	Edit	Remove
7	public	Data	doctable (<i>test1</i>)	0	True	Edit	Remove
9	public	Data	document_types (<i>test1</i>)	0	False	Edit	Remove
3	public	Data	edit_lines (<i>qwc_demo</i>)	0	True	Edit	Remove
2	public	Data	edit_points (<i>qwc_demo</i>)	0	True	Edit	Remove
4	public	Data	edit_polygons (<i>qwc_demo</i>)	0	True	Edit	Remove
10	public	Data	Hauptbahnhof (<i>test1</i>)	0	True	Edit	Remove



News from the project



QWC2 News - Routing

- Routing & Isochrones
- Default Valhalla backend

The screenshot shows the QWC2 Routing interface. The search bar contains "Search place or add map...". The "Routing" panel is active, showing a route from "Tenero, Tenero-Contra, Circolo d..." to "Bellinzona, Circolo di Bellinzona, Dist...". The route is displayed on the map as a blue line. The estimated time is 00:19:19 and the distance is 17.20 km. A "Position" popup is visible, showing coordinates: WGS 84 / Pseudo Mercator: 1003033, 5810276; WGS 84: 9.0104, 46.1864; Elevation: 226 m; Country: Switzerland. The interface also includes a "Reachability" tab and a "Position" popup.

The screenshot shows the QWC2 Routing interface with the "Reachability" tab selected. The search bar contains "Search place or add map...". The "Reachability" panel shows a point "1003394, 5809040 (EPSG:3857)" and a mode of "Time". The intervals are set to 5 and 10 minutes. The reachability area is shown as a blue shaded region on the map. The interface also includes a "Position" popup and a "Position" popup.



OWC2 News – Objektfilter

The screenshot displays the OWC2 web client interface. At the top, there is a search bar with the text "Search place or add map...". Below it is a "Map Filter" panel. The panel has a dark header with a funnel icon and a right arrow. It contains several filter sections:

- Continent:** A dropdown menu with "Africa" selected, a green checkmark, and a list icon.
- Time:** A section with a red 'x' icon, indicating it is not active. It has "From:" and "To:" fields with date pickers.
- Geometry:** A section with three icons: a polygon, a circle, and a point.
- Population:** A section with a green checkmark and a list icon. It has a dropdown menu with "countries" selected and a text input field containing the expression ["pop_est", ">", 50000000].

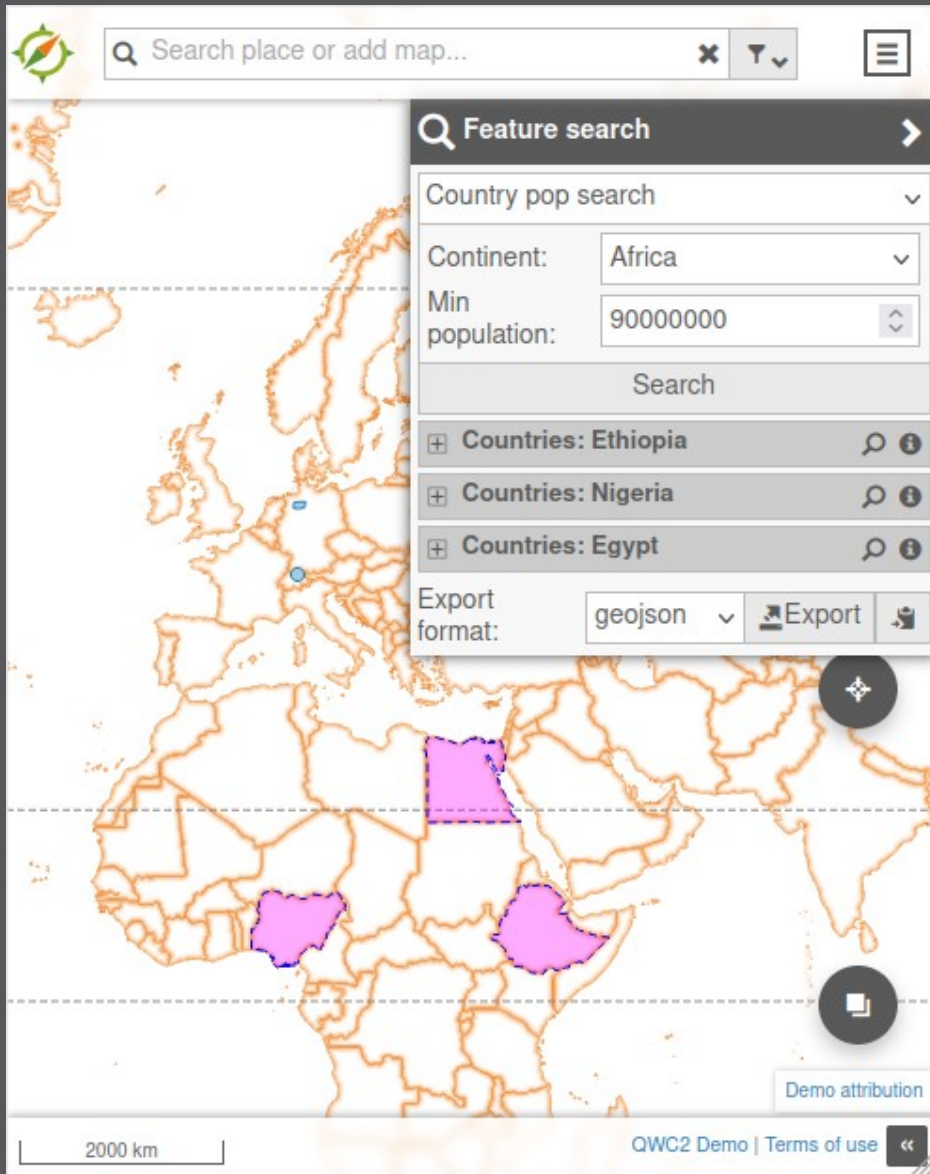
Below the filters is a button labeled "Add custom filter". The map area shows several orange-outlined country shapes. At the bottom, there is a scale bar for 2000 km, a "Demo attribution" link, and a footer with "QWC2 Demo | Terms of use" and a double left arrow icon.

Filter by layer via WMS FILTER

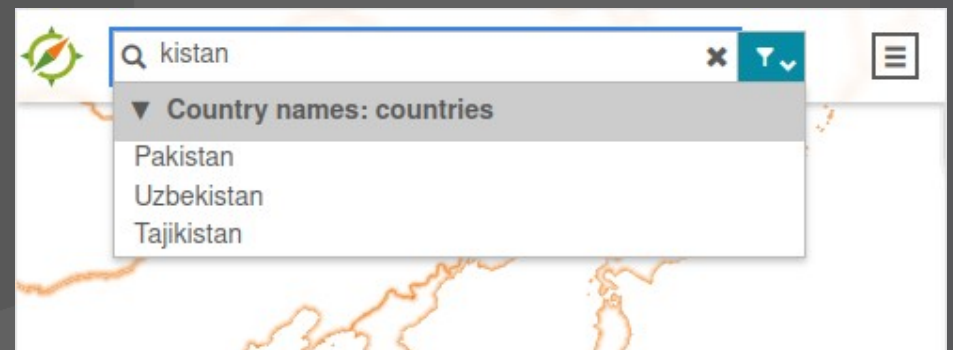
- Predefined filters
- Time filters
- Geometry filters
- Custom filters

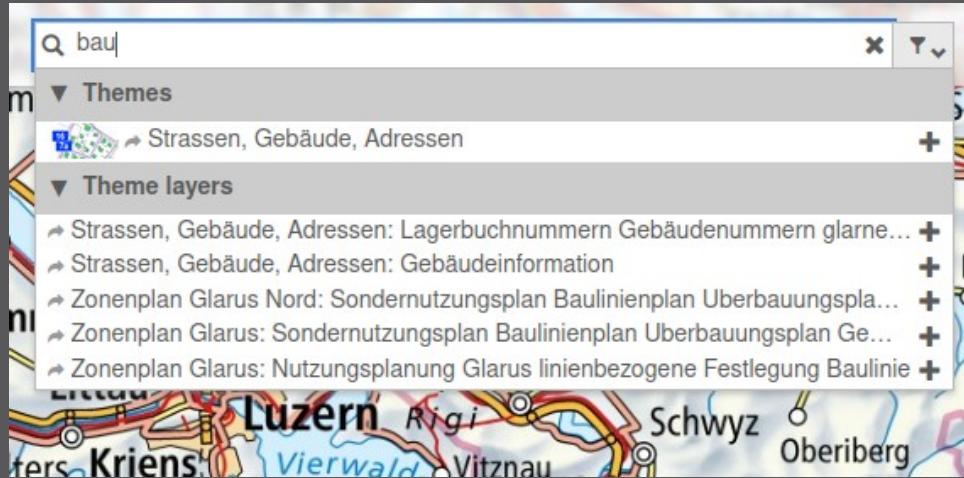


QWC2 News – QGIS Object Search



- QGIS object search via WMS GetFeatureInfo + filter
- Configurable search fields
 - Single-field search also possible via search bar





➤ Theme level search

➤ Add layer

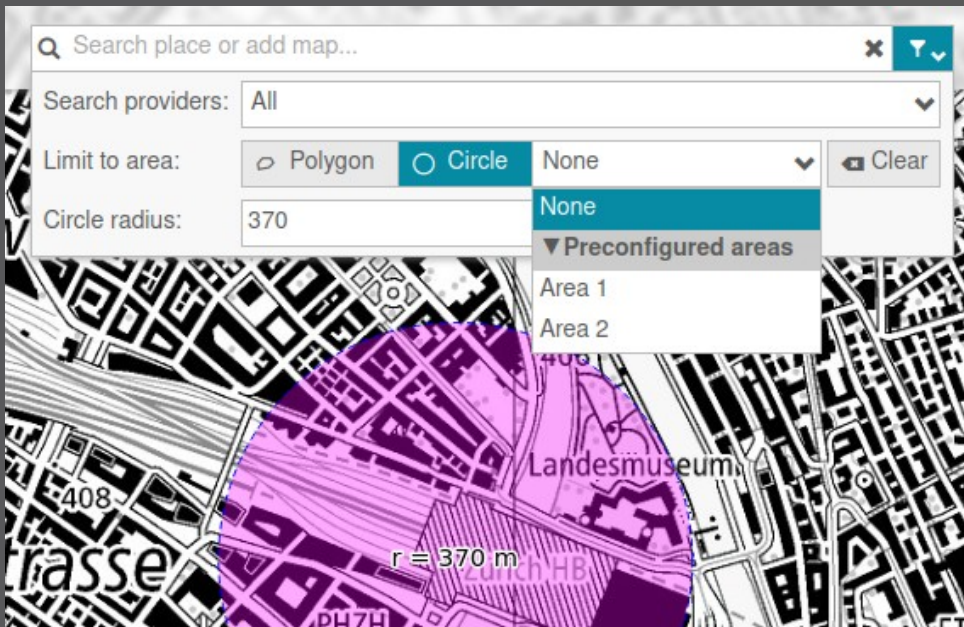
➤ Switch to theme

➤ Search restriction

➤ By provider

➤ Free geometry

➤ Predefined Geometries





QWC2 News – Portal & News Popup

QWC2 Demo Portal

Basiskarte 	Wanderwege, Velorouten 	Strassen, Gebäude, Adressen
Kantonaler Richtplan 	Zonenplan Glarus Nord 	Zonenplan Glarus
Zonenplan Glarus Süd 	Natur- und Landschaftsschutz 	Umweltschutz, KbS
Gewässerschutz 	Denkmalschutz, ISOS, KGS 	Naturgefahren

admin Example.com | Test.com

- Menu
- Help
- External Link
- Another link
- Map Tools
- Logout

Search place or add map...

News

Lorem Ipsum

"Neque porro quisquam est qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit..."

"There is no one who loves pain itself, who seek after it and wants to have it, simply because it i pain..."

What is Lorem Ipsum?

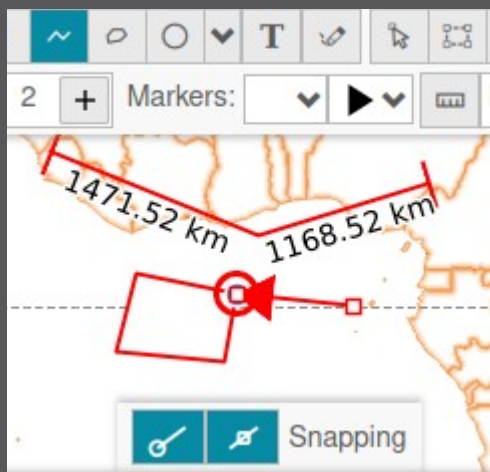
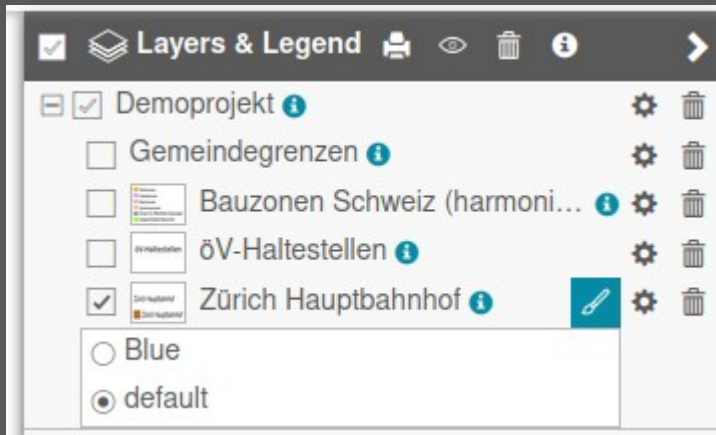
Lorem Ipsum is simply dummy text of printing and typesetting industry. Lor

Close Don't show again

1000 m QWC2 Demo | Terms of use



OWC2 News – Map and Layers



➤ Layers

- WMS style selection
- Group transparency
- GeoPDF Import

➤ Snapping

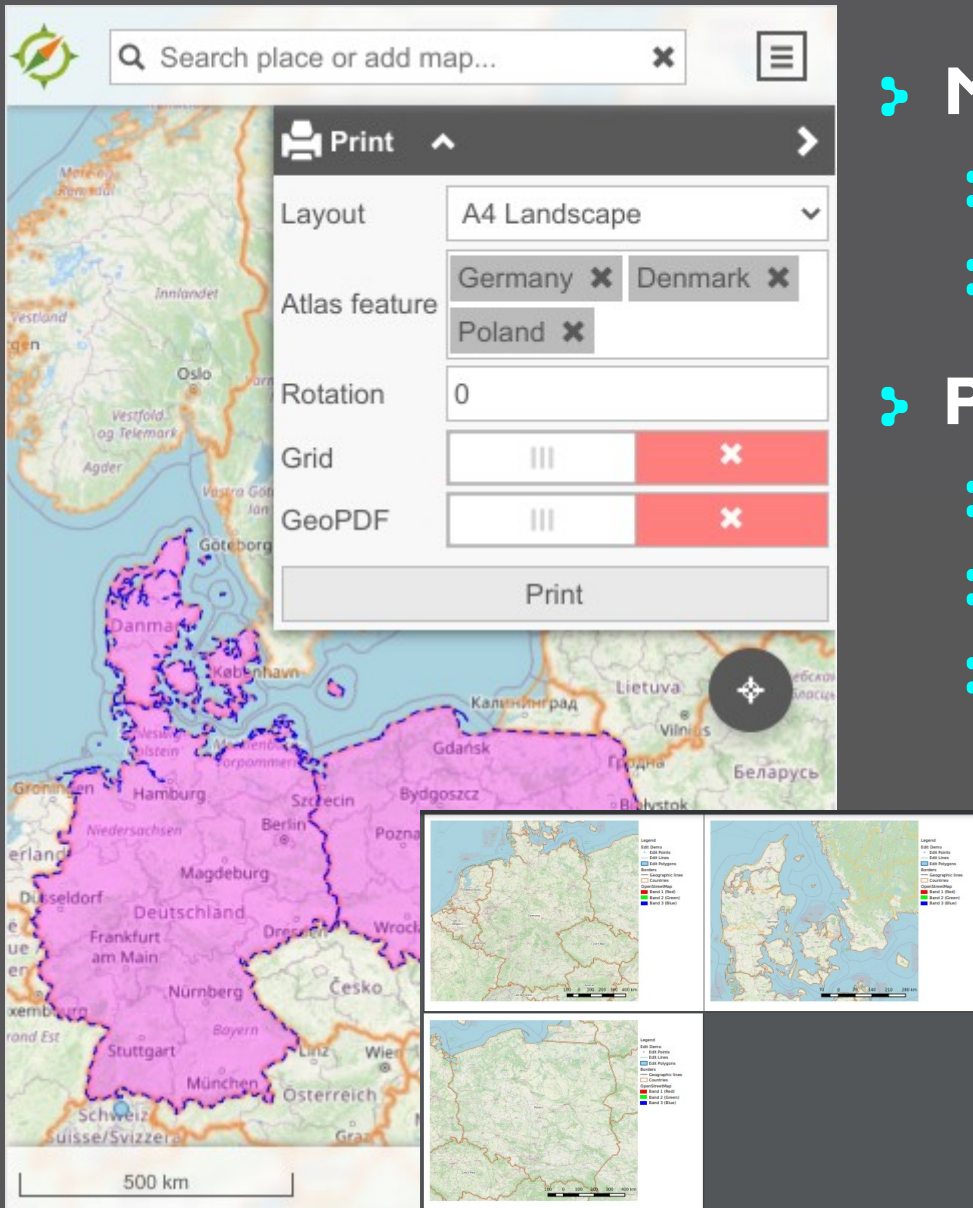
- On nodes/edges
- Also on redlining, WFS, imported vector layers

➤ Redlining

- Lines Arrowheads



QWC2 News – Export & Printing

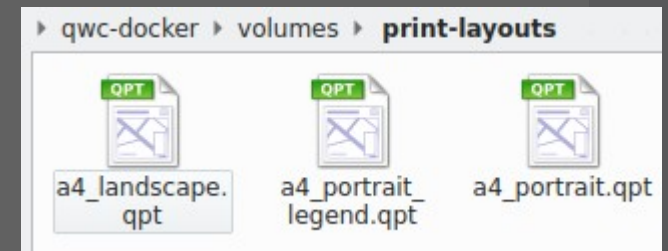


➤ Map Export

- GeoPDF (QGIS 3.36+)
- GeoTIFF

➤ Printing

- Atlas prints
- GeoPDF (QGIS 3.32+)
- Common print layouts for all themes





QWC2 News – Editing

Nachführung bearbeiten

Nachführung

Fixpunkt Nr: 10873470

Identifikation und Geometrie Beschreibung Bilder Administration

Art:	LFP2	Verknüpfte Nachführung:	2023012
NBIdent:	CH0300001087	LK:	1087
Lagegeometrie [m]:	E: 2608066.258	Koordinatenbestimmung:	gemessen (L
	N: 1242342.921	Höhegeometrie [m]:	885.949
<input type="checkbox"/> TSP		Genauigkeit Höhe [m]:	0.040
Genauigkeit Lage [m]:	0.030	Zuverlässigkeit Höhe:	ja
Zuverlässigkeit Lage:	ja		

Schliessen

Abschliessen Schliessen

- Netsed forms
- Clickable links
- Taking respect of QGIS join configuration

Editing

Zürich Hauptbahnhof

Pick Draw Table

302041164

egid 302041164

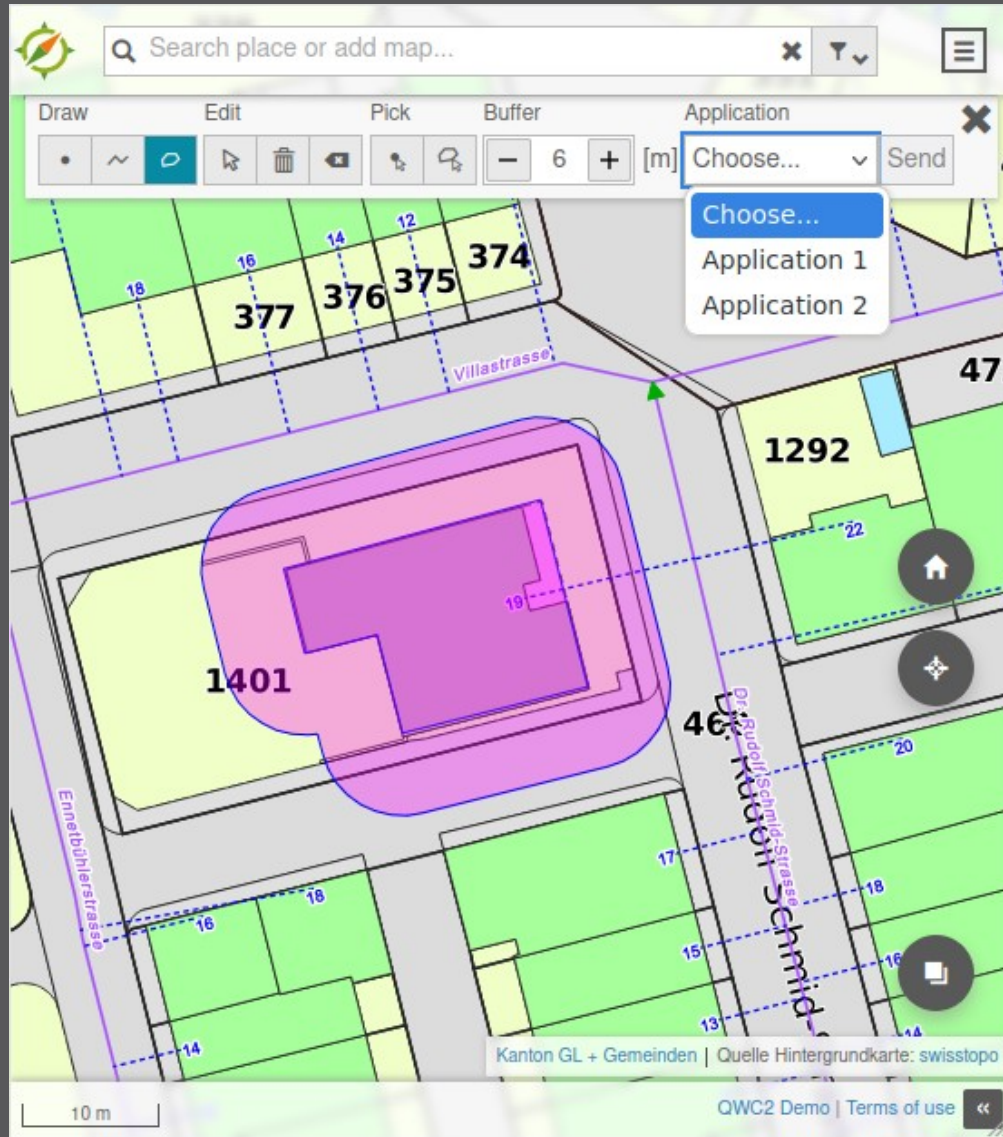
Name www.example.com

Open with Ctrl+Click

Delete



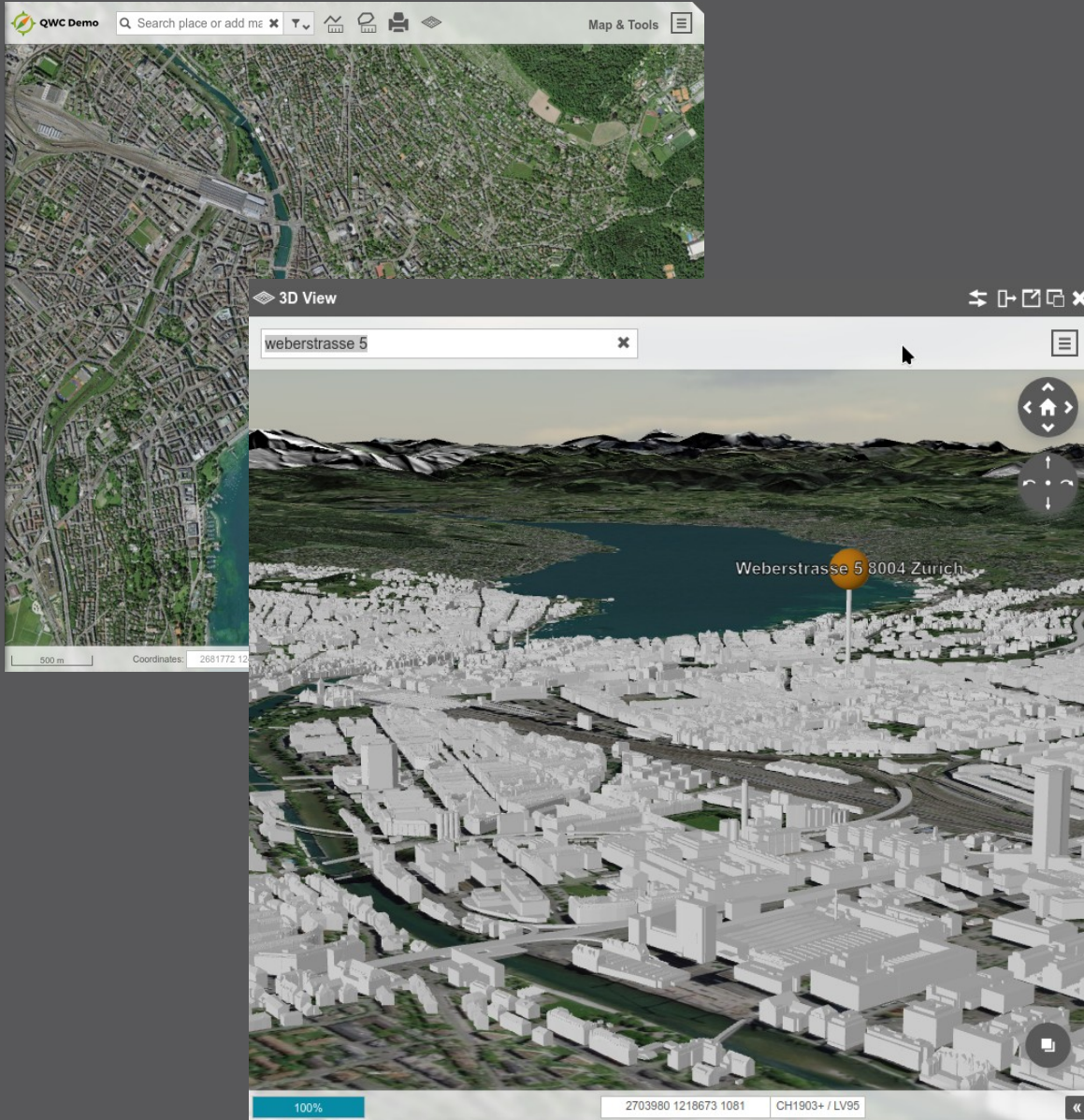
QWC2 News – Geometry capturing



➤ Transfer of captured or selected geometries to third-party applications



QWC2 News – Development of QWC2 - 3D



- Giro3D
- Three.js
- Py3dTiles
- Geopackage-js

City of Frankfurt / City of Detmold / City of Jena / City of Wolfsburg



outlook - financing wanted

- **Sensor data (OGC SensorThings API)**
- **Dashboard-Plugin**
 - Statistics in the map section
- **Document management**
 - Management of PDFs that are used across multiple topics or layers



References

› Homepage / Documentation

› <https://qwc-services.github.io/>

› Main repositories

› <https://github.com/qgis/qwc2-demo-app>

› <https://github.com/qwc-services/qwc-docker>

› Try it out

› <https://qwc2.sourcepole.ch>

› <https://qgiscloud.com>

› <https://map.geo.gl.ch>

› <https://geo.so.ch/map/>



Thank you!



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