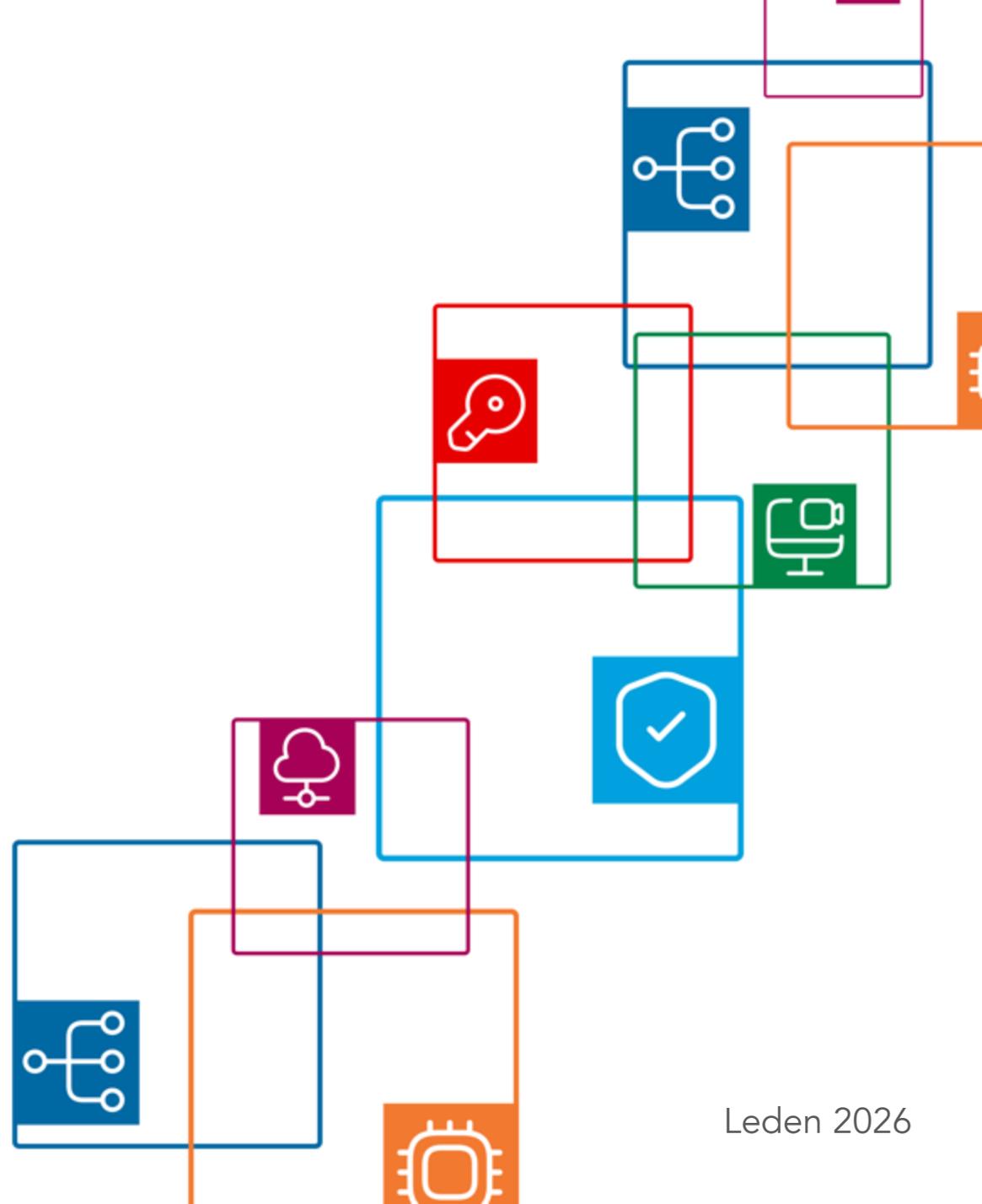




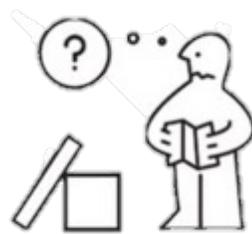
Jak kreslit mapy sítě pomocí NetBoxu

Ladislav Loub

Zlín



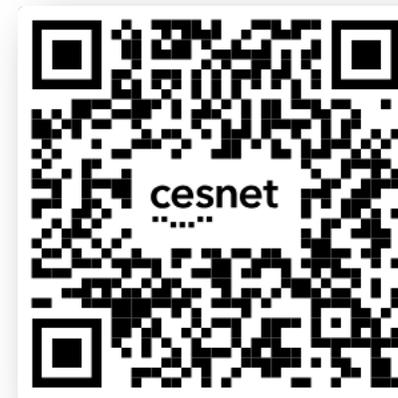
Leden 2026



NetBox

Obecná dokumentace
NetBoxu

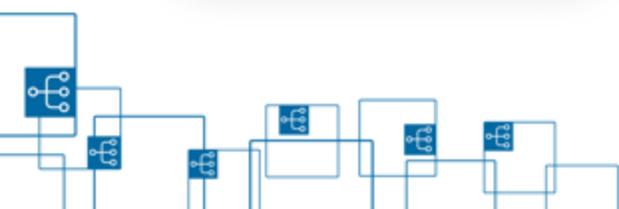
<https://ces.net/netbox>



<https://ces.net/youtube>

CSNOG 2025

Dokumentace síť
CESNET3 pomocí
NetBoxu





NetBox

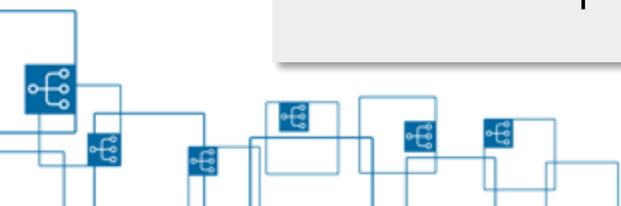
databáze objektů,
souřadnic a propojů

Grafana

pro zobrazení map a
spojení monitoringu

HTML, JS, CSS

pro kreslení panelu
uvnitř Grafany



NetBox nám poslouží jako datová struktura

- Interface Connections
- Custom Objects

 Connections ▼

CONNECTIONS

Cables

Wireless Links

Interface Connections

Console Connections

Power Connections

 Custom Objects ▼

OBJECT TYPES

Custom Object Types

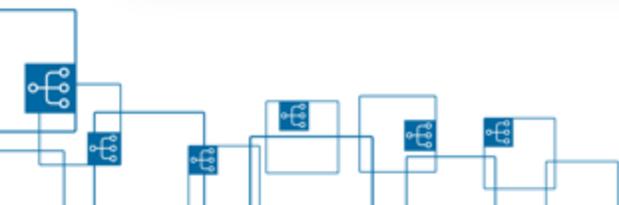
OBJECTS

Contracts

Links

1 2 3 > Showing 1-100 of 249

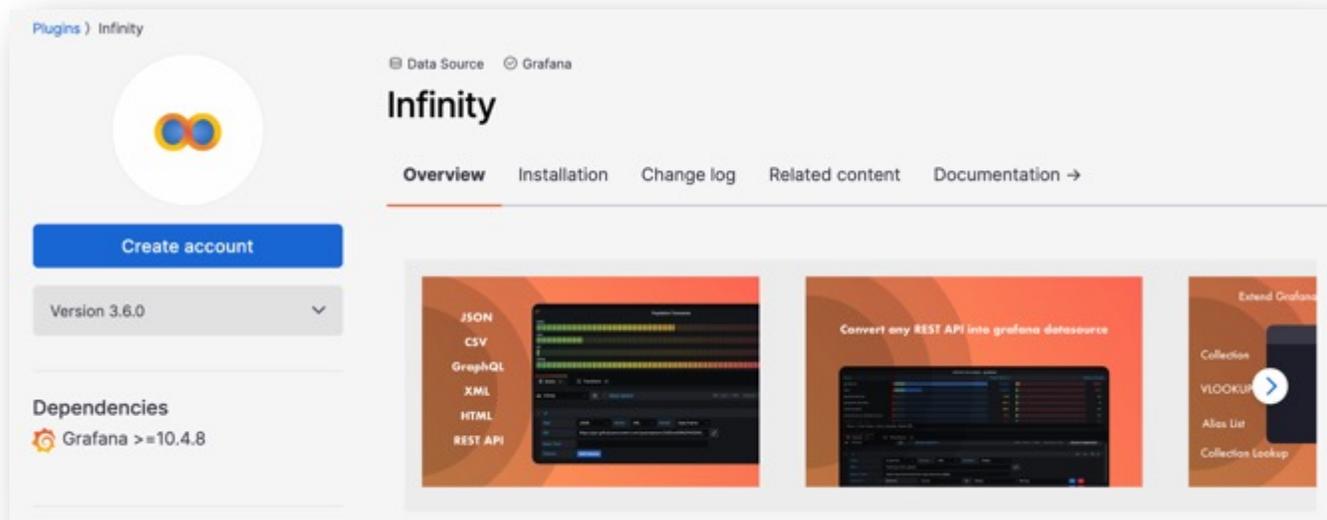
<input type="checkbox"/>	NAME ▾	✖ LABEL	PARENT	CABLE	CONNECTION
<input type="checkbox"/>	FortyGigabitEthernet0/0/0/1/0	—	—	#669	R3 (T05994) > HundredGigabitEthernet0/0/0/2



Grafana má rozšíření pro API – Infinity plugin

- REST API
- GraphQL API
- JSON
- CSV
- ...

Propojíme Grafanu a NetBox



The screenshot shows the Grafana Infinity plugin page. On the left, there is a 'Plugins' sidebar with 'Infinity' selected. The main content area displays the 'Infinity' plugin details, including a 'Create account' button, the version '3.6.0', and a dependency on 'Grafana >=10.4.8'. Below this, there are three promotional cards: one listing supported data formats (JSON, CSV, GraphQL, XML, HTML, REST API), one titled 'Convert any REST API into grafana datasource', and one titled 'Extend Grafana' with a 'VLOOKUP' button.



Netbox
Infinity

 Build a dashboard

 Explore

GraphQL dotaz

Netbox

Type GraphQL Parser UQL Source URL Format Table

Method POST URL https://done.cesnet.cz/graphql/

Headers, Body, Request params

URL options Method, Body, Additional headers & parameters

Body Type None Raw Form Data x-www-form-urlencoded GraphQL

GraphQL query

```
query MyQuery {
  lldp_neighbor_list(filters: {status: {exact: "active"}})
  interface_a {
    name
    device {
      name
      latitude
      longitude
    }
  }
  interface_b {
```

HTTP Headers Add header

URL Query Params Add query param



Můžeme vyzkoušet
nejprve v NetBox
GraphQL exploreru

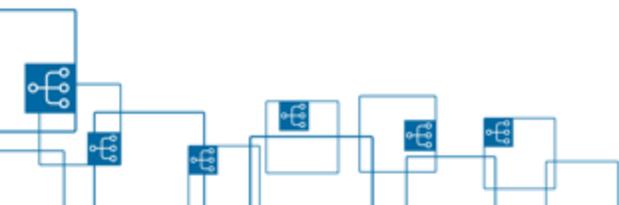
Inspect: CESNET3

Data Stats Query JSON

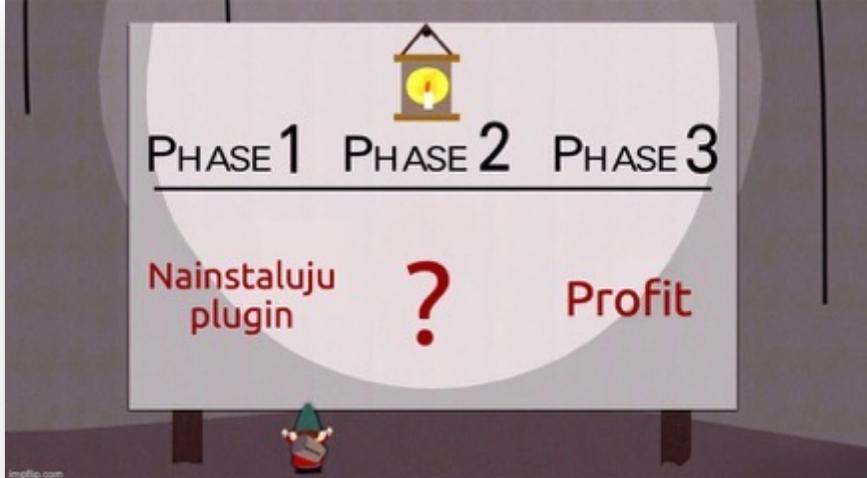
> Data options A, Formatted data [Download CSV](#)

Latitude A	Latitude B	Longitude A	Longitude B	A device_a	A device_b	A strip_interface_a	A strip_interfac
50.0	50.1	14.5	14.4	CAT51	S1B	0/9	1/0/15
50.0	50.1	14.5	14.5	CAT51	S2A	0/10	1/0/4
50.1	50.1	14.4	14.4	CAT79	R115	1/1	1/1

Každý řádek
reprezentuje jeden
propoj



Kreslíme mapu



1

Zapneme plugin
Business Text



2

Napišeme
jednoduchých 297
řádků Javascriptu



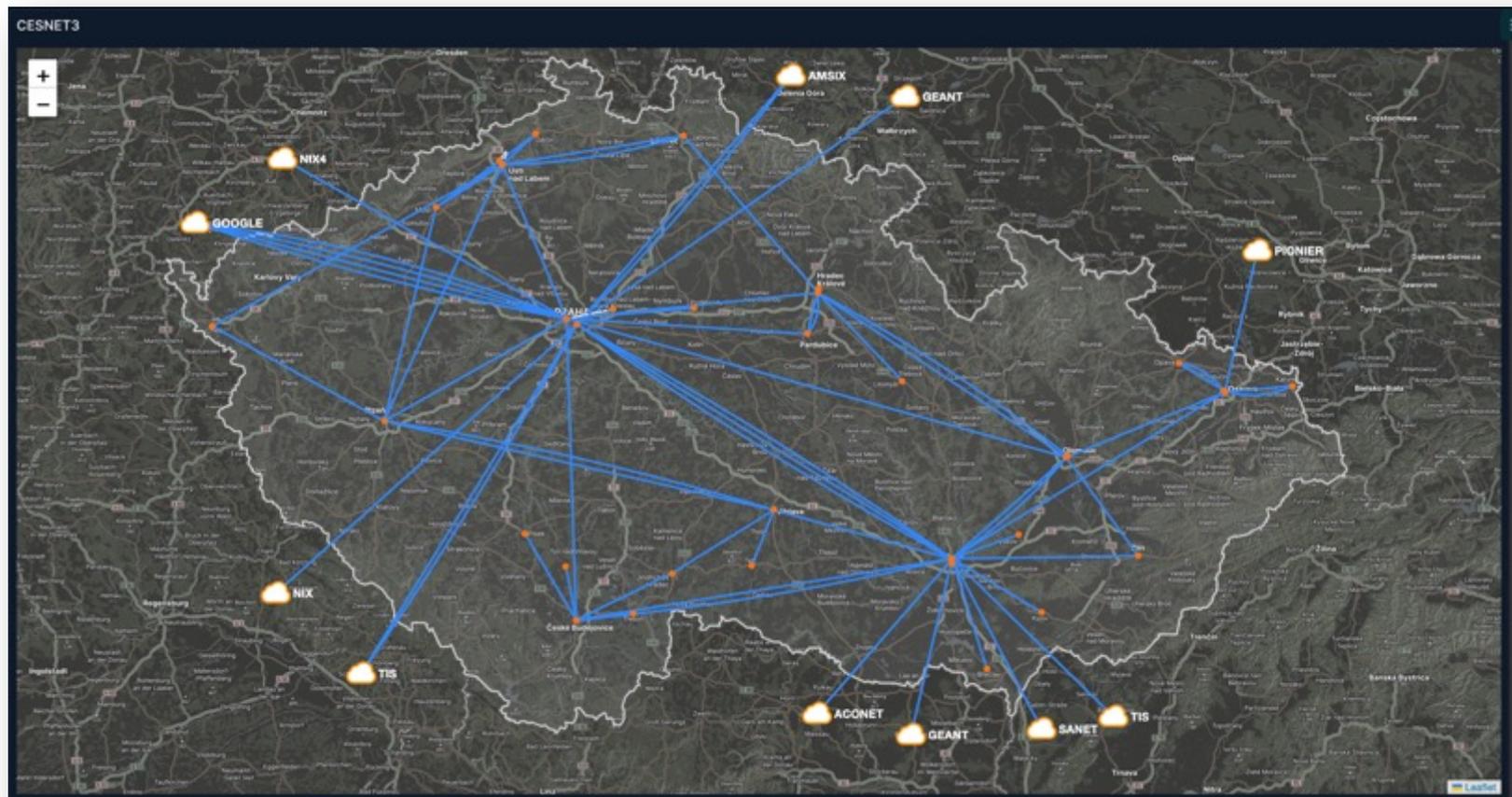
3

Mapa...



```
287 // Update circle sizes on zoom
288 map.on('zoom', function () {
289     if (map.getZoom() !== currentZoom) {
290         updateCircleRadius();
291         currentZoom = map.getZoom();
292     }
293 });
294
295 // Watermark as Global Status
296 L.Control.Watermark = L.Control.extend({
297     onAdd: function (map) {
298         var div = L.DomUtil.create('div', 'leaflet-control-watermark');
299         div.innerHTML = (globalStatus == "red") ? '<span class="blinking-text">!!-
300         return div;
301     },
302 });
303 L.control.watermark = function (opts) {
304     return new L.Control.Watermark(opts);
305 }
306 L.control.watermark({ position: 'bottomleft' }).addTo(map);
307
308 });
309 });
```

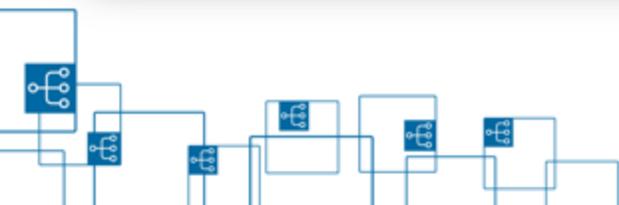




Co nám chybí?

Chybí nám
monitoring!

Tak další data-source



Plugins | InfluxDB

Data Source Grafana

InfluxDB

Overview Installation Related content

Create account

Developer

Grafana Labs

InfluxDB data source

Grafana ships with built-in support for InfluxDB releases >0.9.x.

There are separate data sources for InfluxDB in Grafana: the latest InfluxDB release and InfluxDB 1.x. Grafana maintains support for 1.x as a convenience for its existing users. InfluxDB no longer maintains support for 1.x.



Plugins | Infinity

Data Source Grafana

Infinity

Overview Installation Change log Related content Documentation →

Create account

Version 3.6.0

Dependencies

Grafana >=10.4.8

- JSON
- CSV
- GraphQL
- XML
- HTML
- REST API

Convert any REST API into grafana datasource

Extend Grafana

Collection

VIEW

Alias List

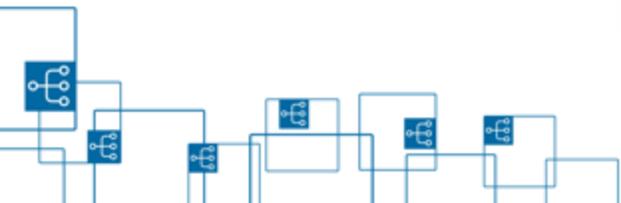
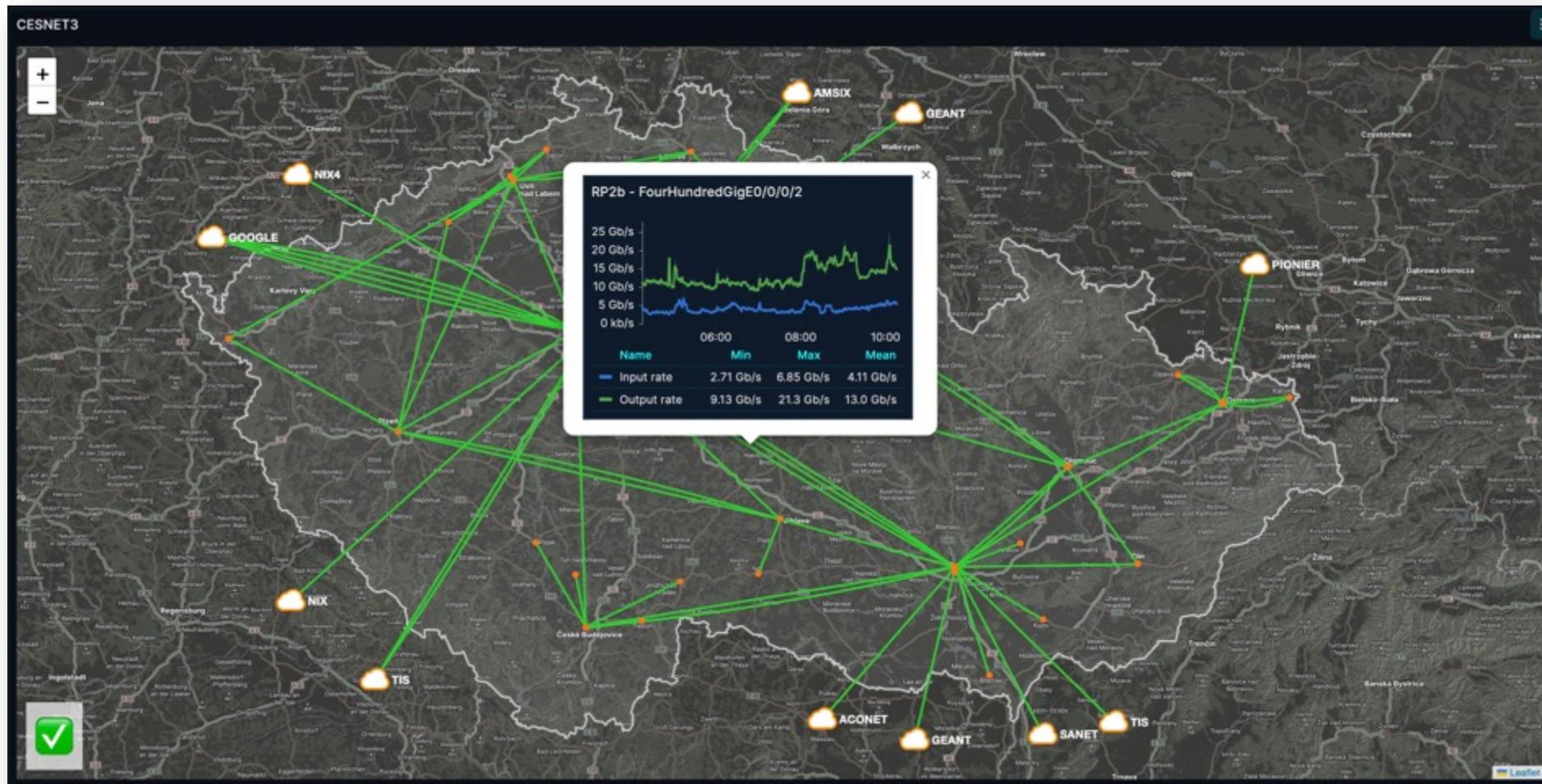
Collection Lookup

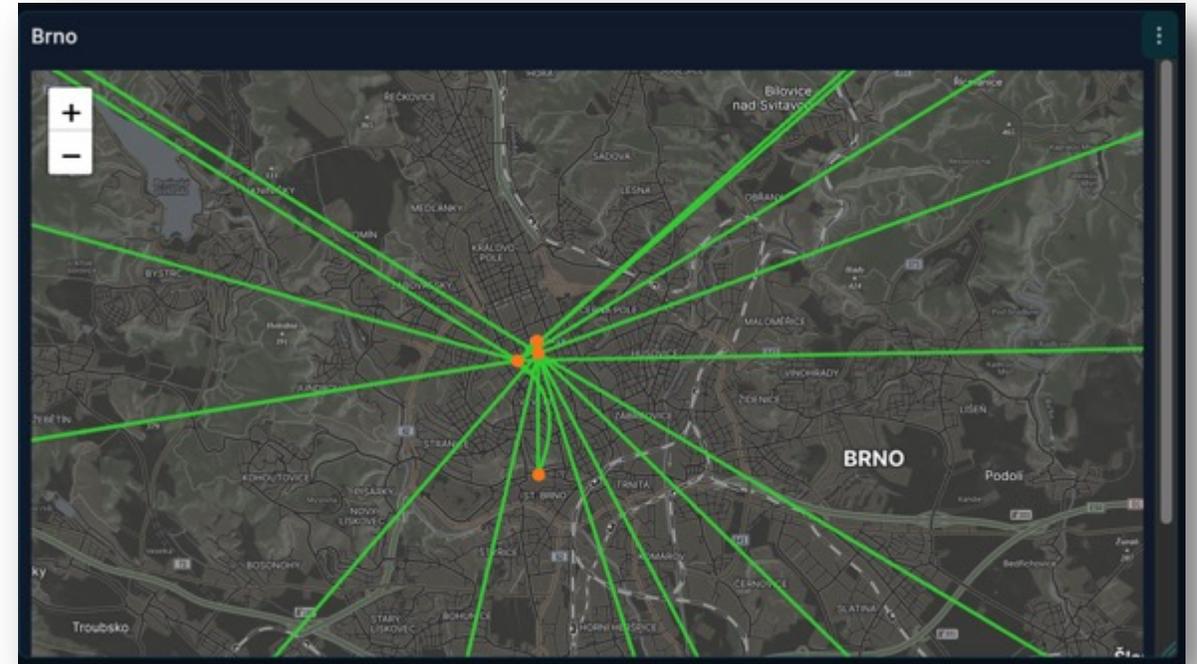
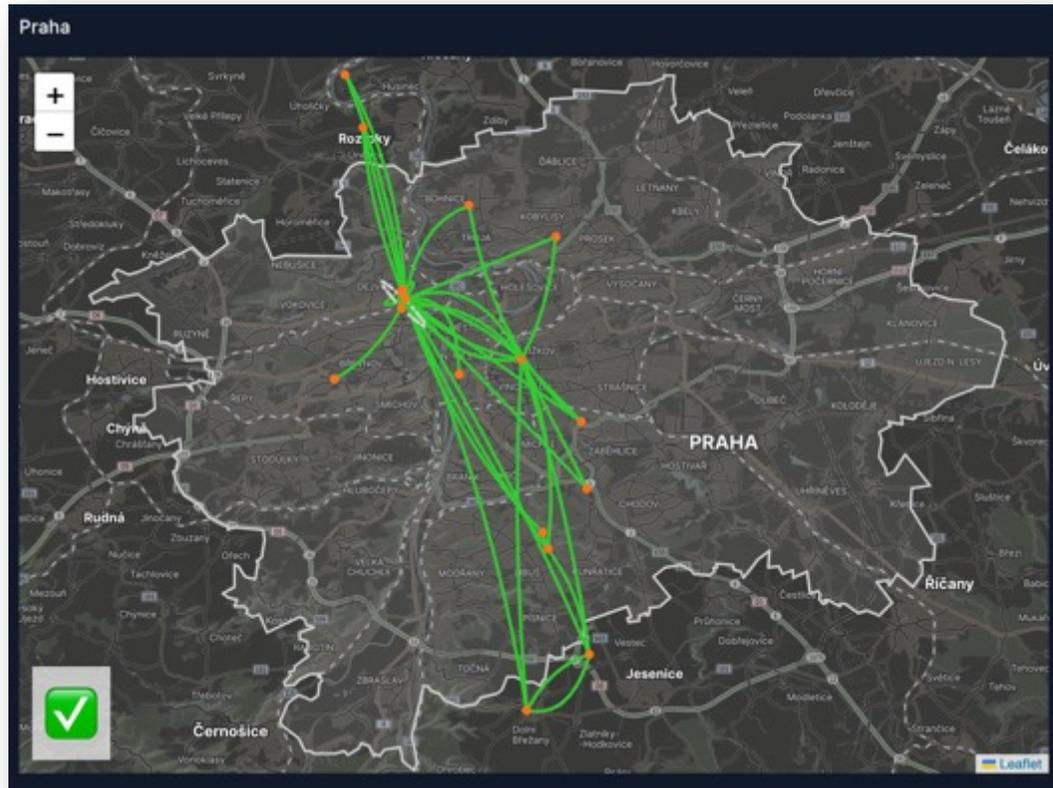
A dalších asi 90 řádků
kódu



V mapě se automaticky změnila topologie, když se v Netboxu upraví propoje

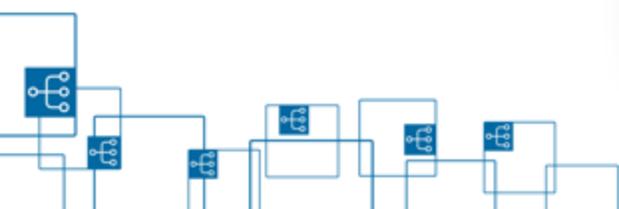
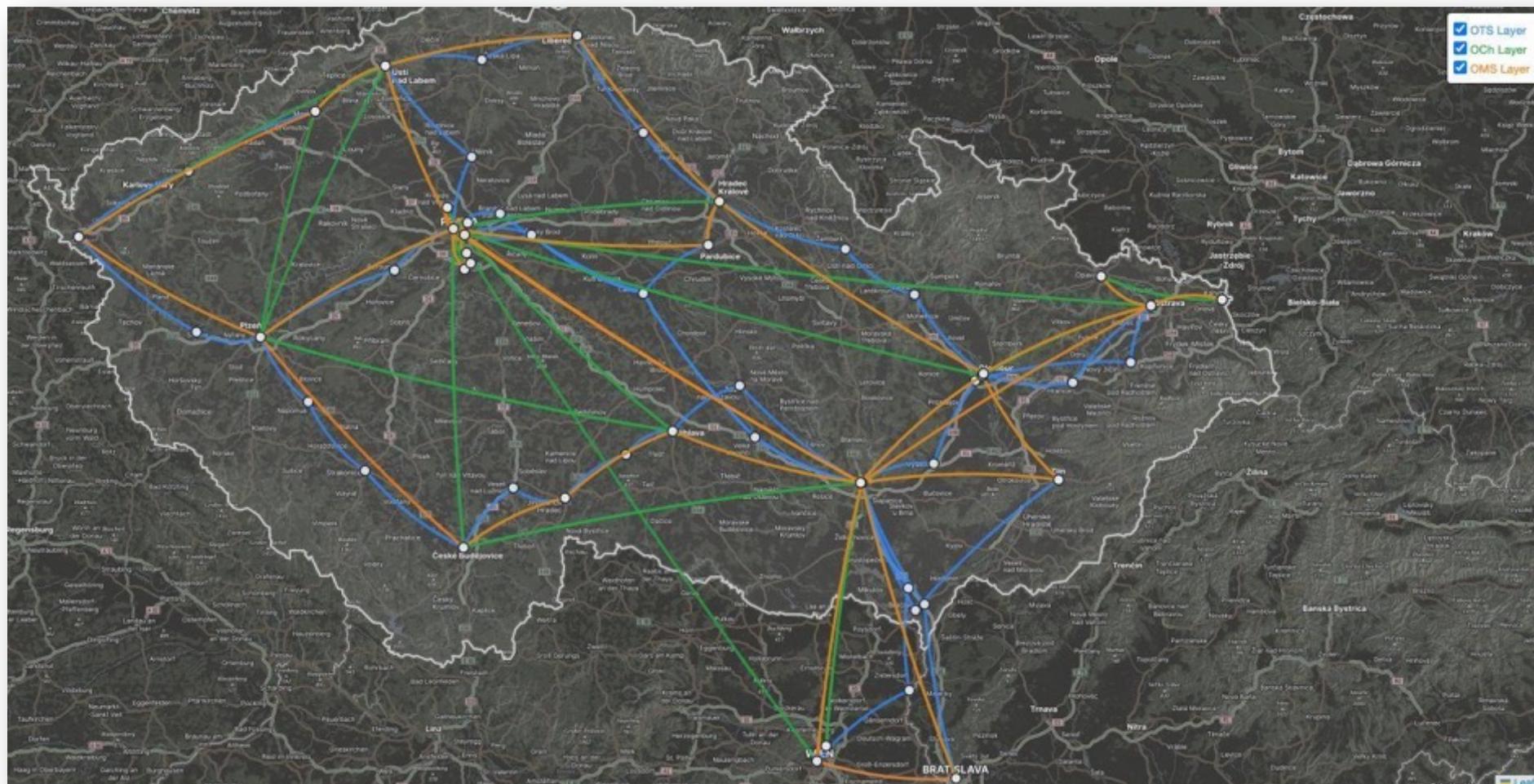
Nyní slouží i jako monitoring



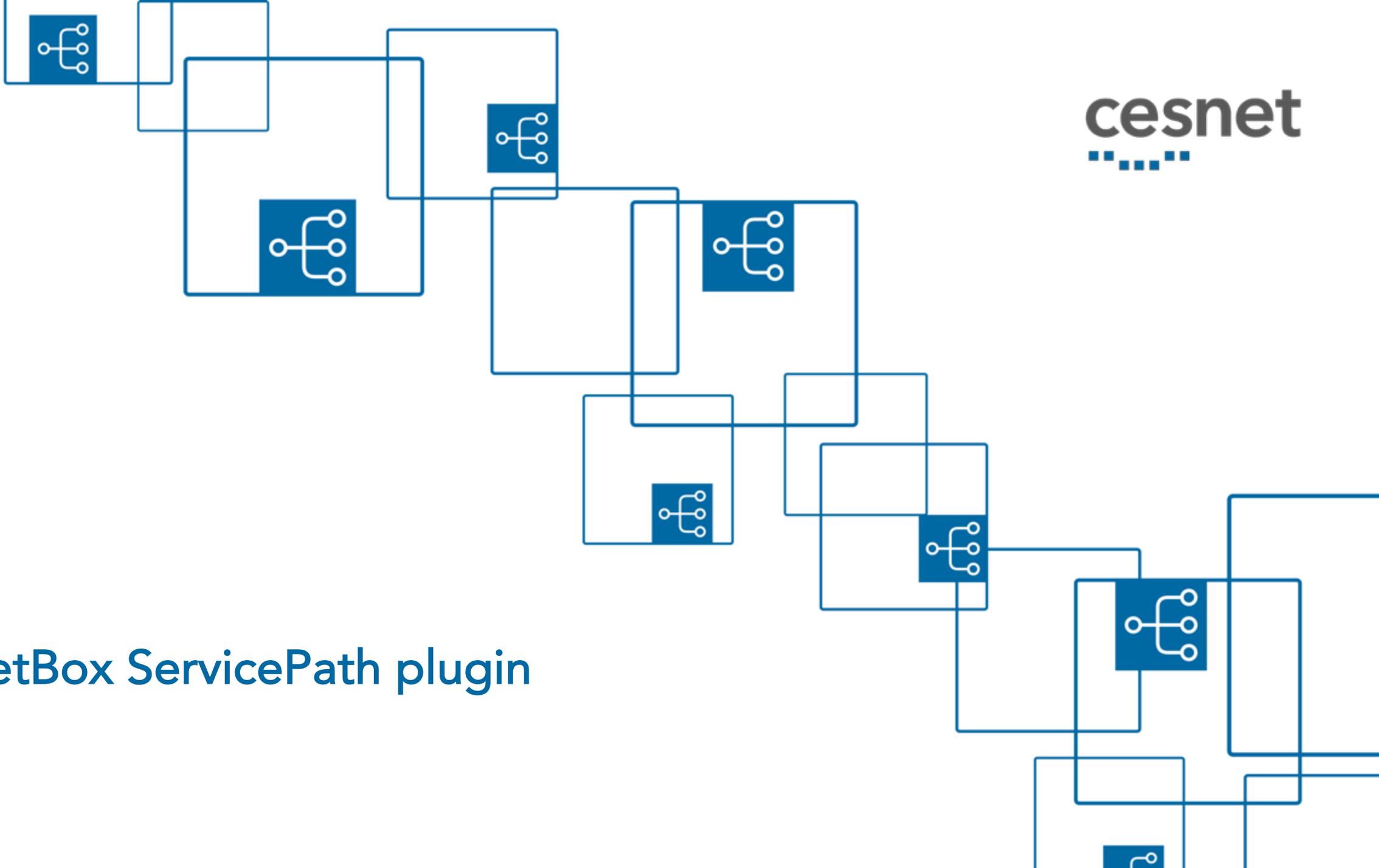


Plán je vytvoření map dle různých prokolů:

- OMS
- OCH
- LLDP
- ISIS
- L2VPN
- ...

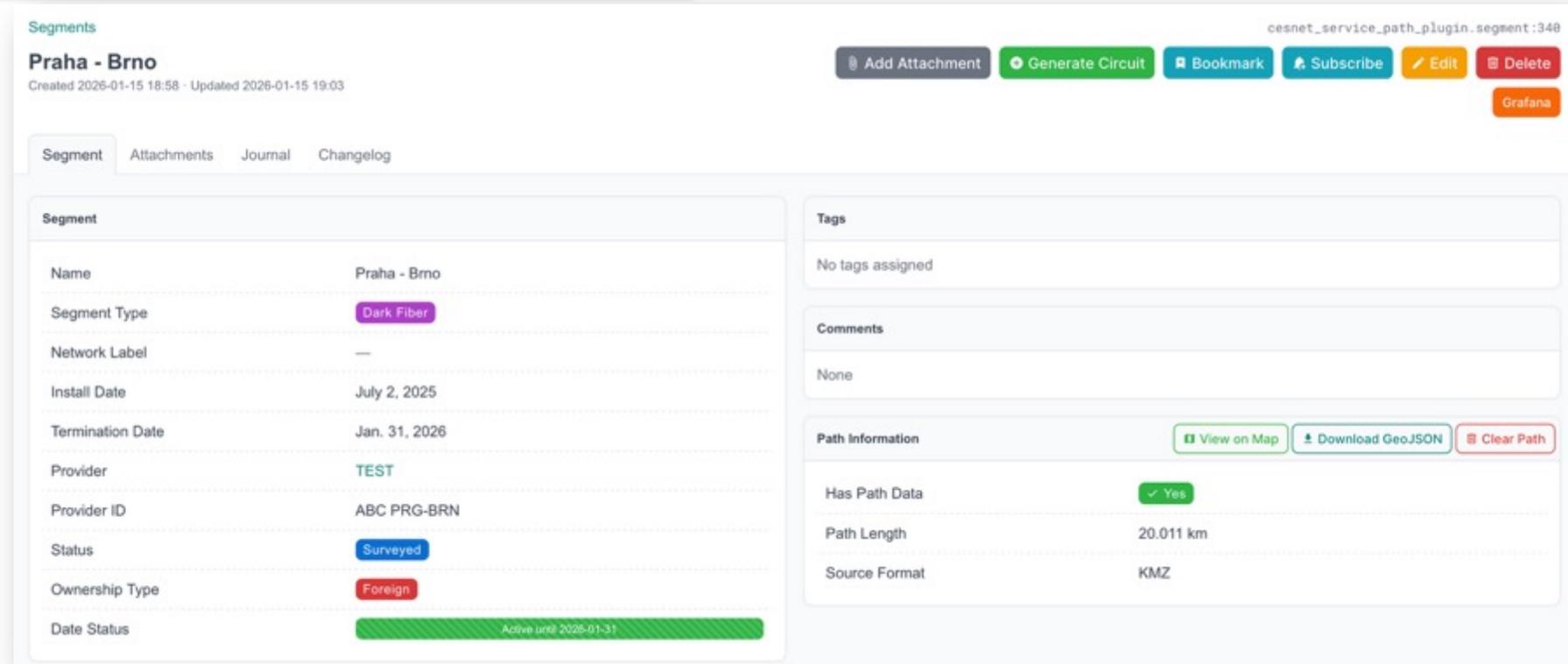


NetBox ServicePath plugin



Bud' využijeme Circuits a průběhy uložíme
někam jinam

nebo si napíšeme plugin

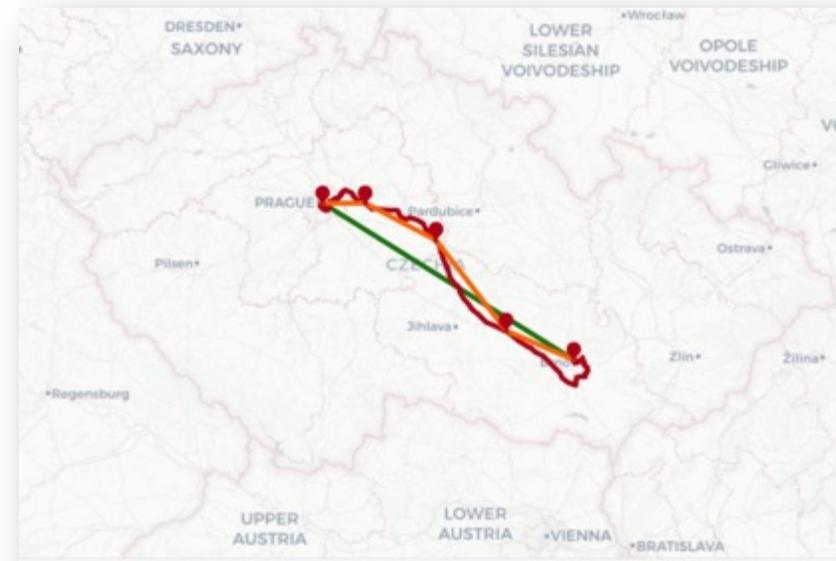
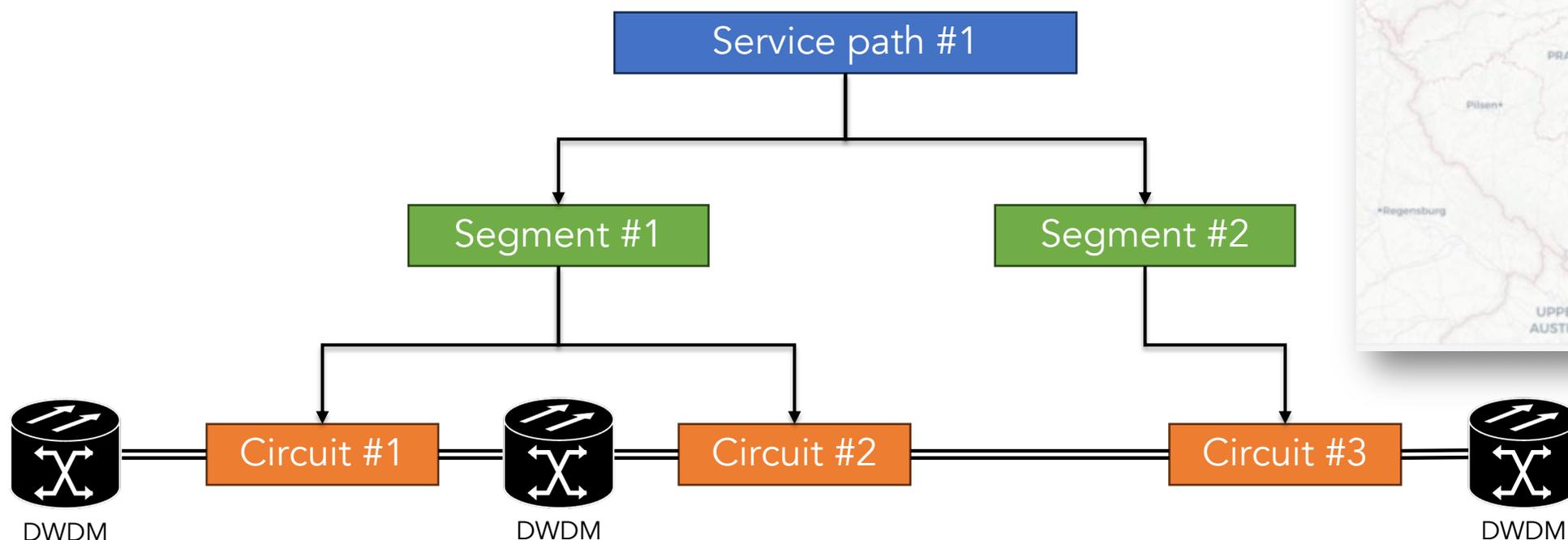


The screenshot displays the 'Segments' page for a specific segment named 'Praha - Brno'. The interface includes a header with the segment name and creation/update dates, a toolbar with actions like 'Add Attachment', 'Generate Circuit', 'Bookmark', 'Subscribe', 'Edit', 'Delete', and 'Grafana', and a navigation menu with 'Segment', 'Attachments', 'Journal', and 'Changelog'. The main content area is divided into two columns: a left column for segment details and a right column for path information and actions.

Segment	
Name	Praha - Brno
Segment Type	Dark Fiber
Network Label	—
Install Date	July 2, 2025
Termination Date	Jan. 31, 2026
Provider	TEST
Provider ID	ABC PRG-BRN
Status	Surveyed
Ownership Type	Foreign
Date Status	Active until 2025-01-31

Path Information	
Has Path Data	✓ Yes
Path Length	20.011 km
Source Format	KMZ

Additional actions and information on the right side include: 'View on Map', 'Download GeoJSON', 'Clear Path', 'No tags assigned', and 'Comments: None'.



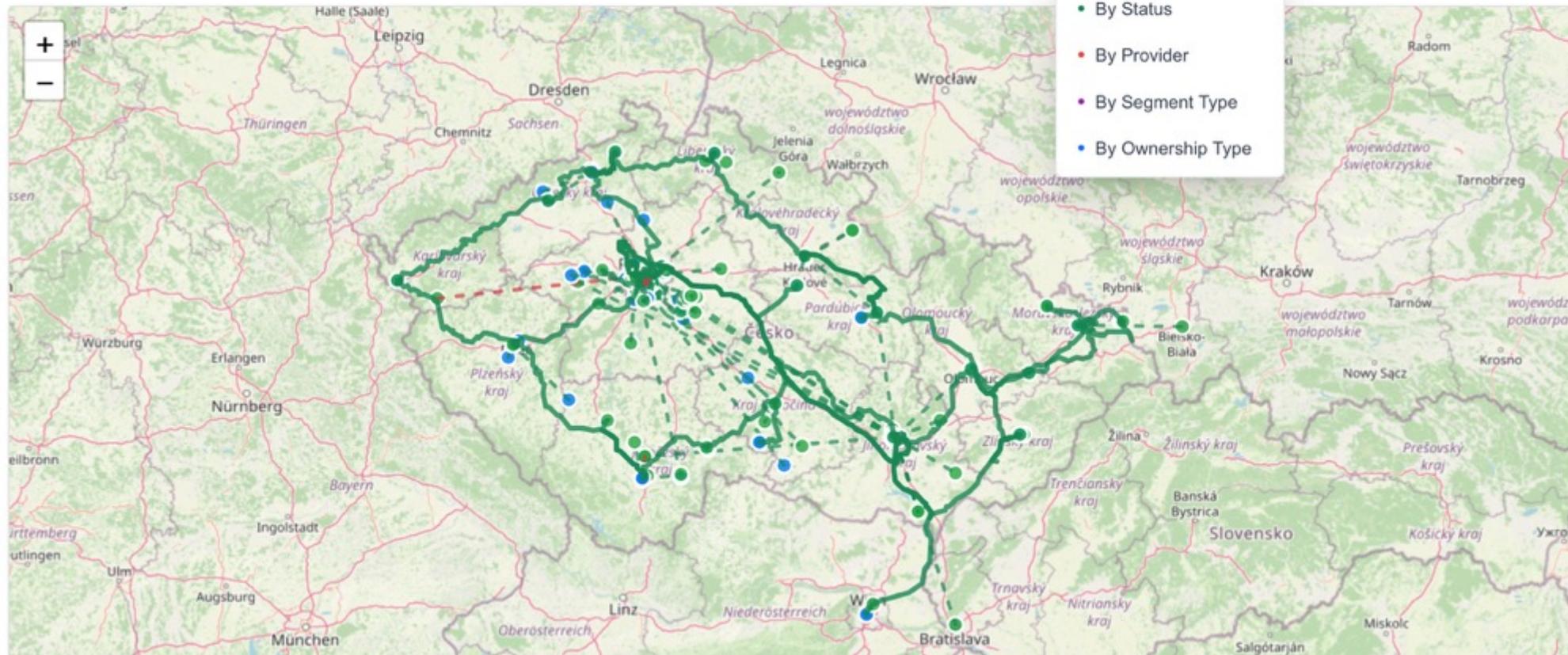
Service path = spojení segmentů

- M x N vazba na segmenty

Segment = Smlouva od poskytovatele

- Dark fibers
- Optical spectrum
- Ethernet service

Segments Map View

[+ Add](#) [↑ Import](#) [↓ Export](#)Results **336** FiltersSegments Map **336 segments**[Table View](#) [Status](#) [Legend](#) [Fit All](#) [OpenStreetMap](#)

Active Contract Information

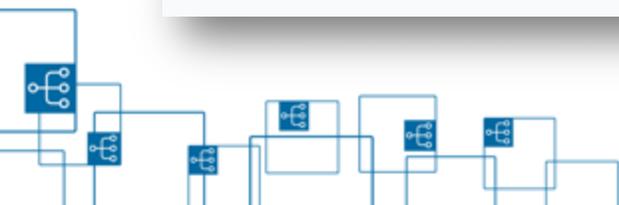
[Detail View](#)
[Edit](#)
[New Version](#)

Contract Number	C1
Contract Type	New Contract
Version	v1 Active
Currency	Czech Koruna (CZK)
Recurring Charge	CZK 2 000.00
Recurring Period	Monthly
Number of Charges	24
Total Recurring Cost	CZK 48 000.00
Non-Recurring Charge	CZK 1 000.00
Total Contract Value	CZK 49 000.00
Start Date	Nov. 1, 2025
End Date	March 31, 2026
Commitment End Date	Nov. 1, 2027

Contract Version History

C1 1 version

VERSION	TYPE	STATUS	ACTIONS
v1	New Contract	Active	Current



⚙️ **Technical Specifications** Dark Fiber

Fiber Mode Single-mode (SMF)	Single-mode Subtype G.652 - Standard SMF	Jacket Type Indoor
Total Loss (dB) 80.00	Total Length (km) 200.000	Number of Fibers 2
Connector Side A LSH/APC	Connector Side B LSH/APC	

Edit Delete

Side A Site Praha-Zikova Location —	Side B Site Brno-MUNI Location —
---	--

Related Circuits + Add to Circuit

CIRCUIT ID ▾	STATUS	SIDE A	SIDE Z	TERMINATES	TAGS	SEGMENTS
CIR-Praha - Brno	Active	—	—	2026-01-31	—	Praha - Brno

Showing 1-1 of 1 Per Page ▾

Topology of Service Path Plzeň - České Budějovice

Plzeň - České Budějovice

Plzeň-ZČU - České
Budějovice-JČU [ČDT] #1

cesnet
"...."

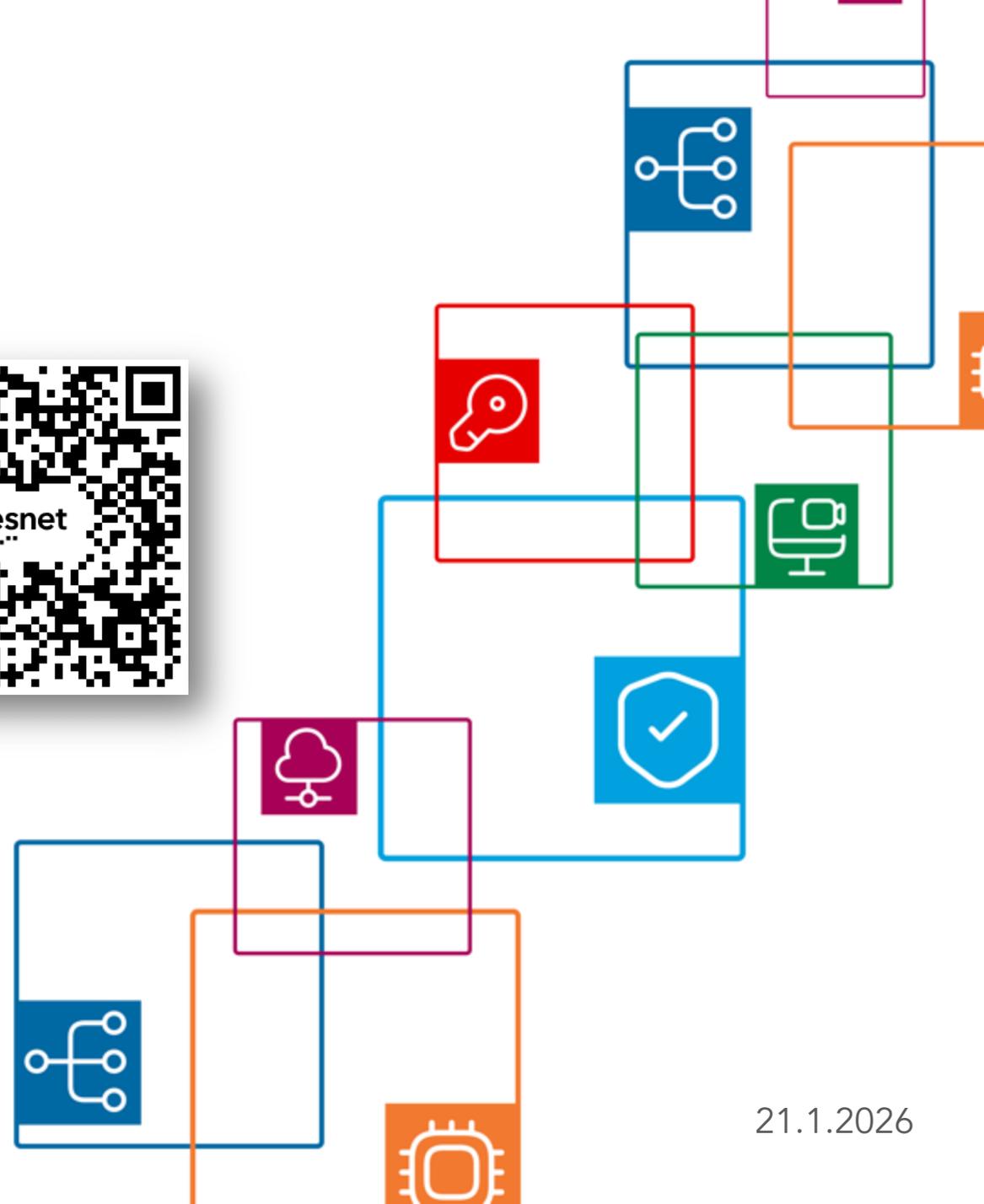


Děkuji za pozornost!

Ladislav Loub

Zlín 2026

#PROPOJUJEME VĚDU



21.1.2026