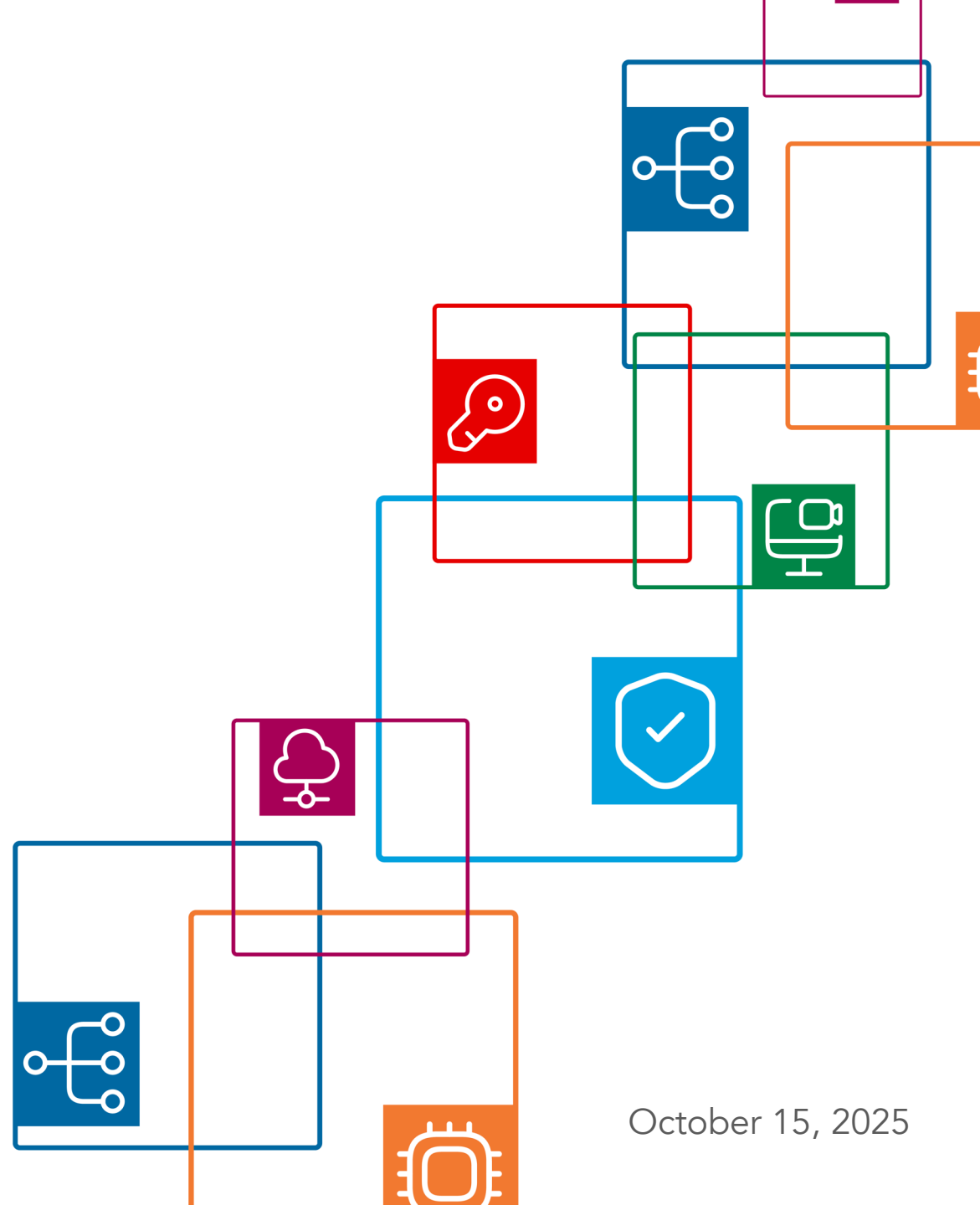




# CESNET NetBox plugins

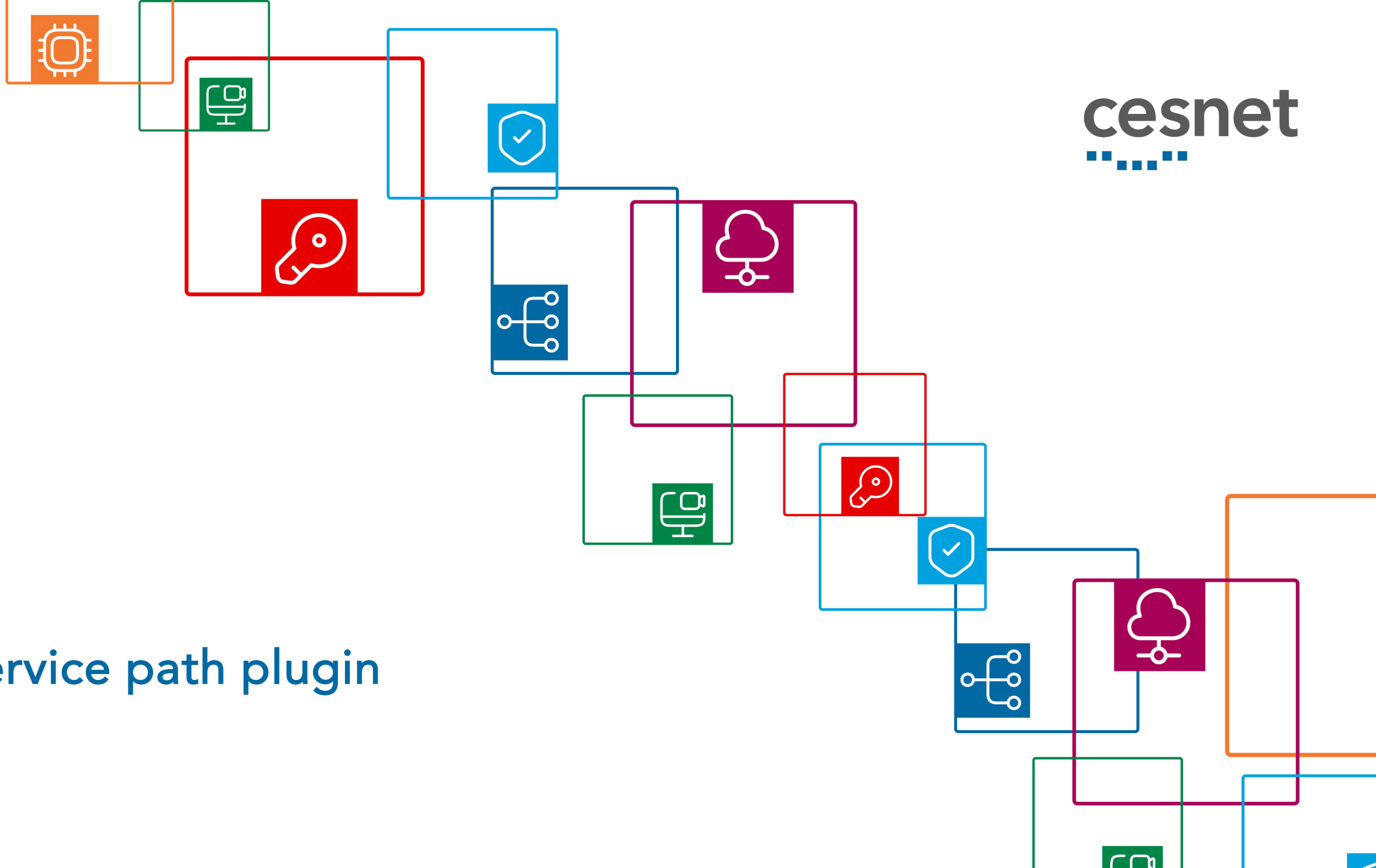
Ladislav Loub

Barcelona



October 15, 2025

# Service path plugin



- NetBox has native Circuits
  - **Insufficient** for our use case
- We needed track multiple Circuits from one supplier
  - Development started before Circuit Groups existed

Segments

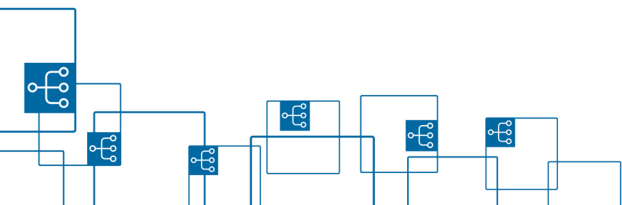
## Brno-MUNI - Bratislava-SANET [Türk Telekom] #1

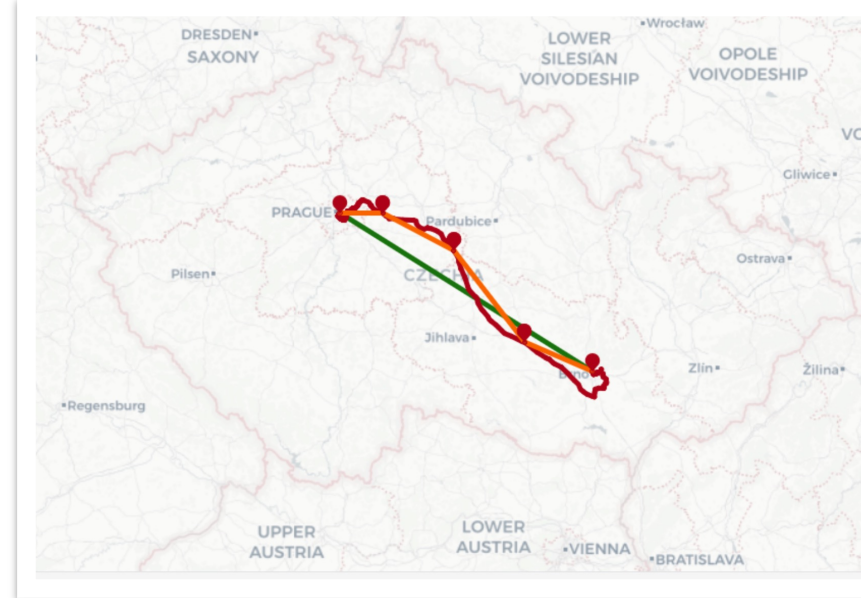
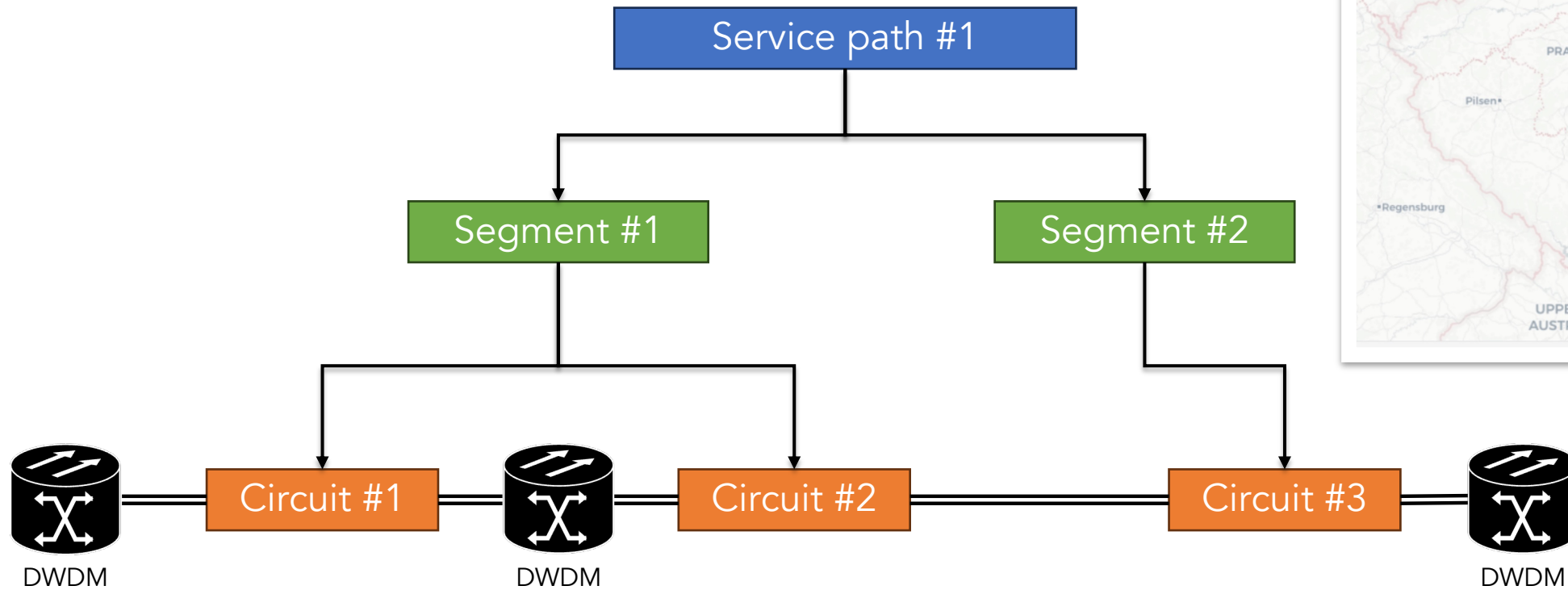
Created 2024-07-10 13:42 · Updated 2025-10-06 10:12

Segment Attachments Journal Changelog

Segment

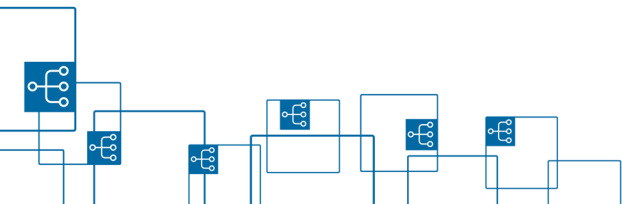
Name	Brno-MUNI - Bratislava-SANET [Türk Telekom] #1
Segment Type	Dark Fiber
Network Label	—
Install Date	—
Termination Date	—
Provider	A1473 - Türk Telekom International CZ s.r.o. ⌵
Provider Name	—
Provider ID	DF000442 ces01349a.df*brq-bcv
Provider Contract	—
Status	Active
Date Status	—





Segment = Contract from Provider

- Dark fibers
- Optical spectrum
- Ethernet service



**Side A**

Site: Brno-MUNI

Location: D109 "nový sál"

**Side B**

Site: Bratislava-SANET

Location: Servrovná

**Related Circuits** + Add to Circuit

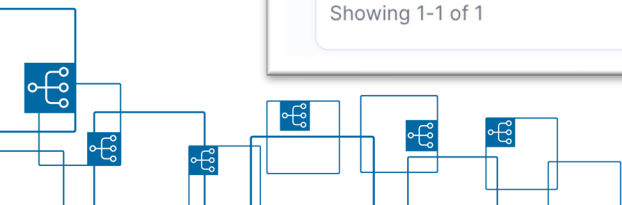
CIRCUIT ID	STATUS	SIDE A	SIDE Z	TERMINATES	TAGS	SEGMENTS
CES BRNMUN - HRSOLA 1 <span>≡</span>	Active	Brno-MUNI	Hrušky-OLA	—	<span style="background-color: #007bff; color: white; padding: 2px;">CESNET</span> <span style="background-color: #6c757d; color: white; padding: 2px;">[CIRCUIT] - Dark fiber</span> <span style="background-color: #007bff; color: white; padding: 2px;">[CIRCUIT] - Duplex fiber</span> <span style="background-color: #6c757d; color: white; padding: 2px;">[DWDM] - Bratislavský okruh</span> <span style="background-color: #dc3545; color: white; padding: 2px;">[TECH] - Ribbon DWDM</span>	Brno-MUNI - Bratislava-SANET [Türk Telekom] #1 <span style="float: right; color: orange;">✎</span>
CES HRSOLA - BRSSAN 1 <span>≡</span>	Active	Hrušky-OLA	Bratislava-SANET	—	<span style="background-color: #007bff; color: white; padding: 2px;">CESNET</span> <span style="background-color: #6c757d; color: white; padding: 2px;">[CIRCUIT] - Dark fiber</span> <span style="background-color: #007bff; color: white; padding: 2px;">[CIRCUIT] - Duplex fiber</span> <span style="background-color: #6c757d; color: white; padding: 2px;">[DWDM] - Bratislavský okruh</span> <span style="background-color: #dc3545; color: white; padding: 2px;">[TECH] - Ribbon DWDM</span>	Brno-MUNI - Bratislava-SANET [Türk Telekom] #1 <span style="float: right; color: orange;">✎</span>

Showing 1-2 of 2 Per Page ▾

**Related ServicePaths** + Add to ServicePath

NAME	STATUS	KIND	TAGS
Brno - Břeclav Hrušky (SK)	Active	Páteřní	— <span style="float: right; color: orange;">✎</span>

Showing 1-1 of 1 Per Page ▾



- We wanted to save geopath
- Ability to upload .geojson, .kml, .kmz

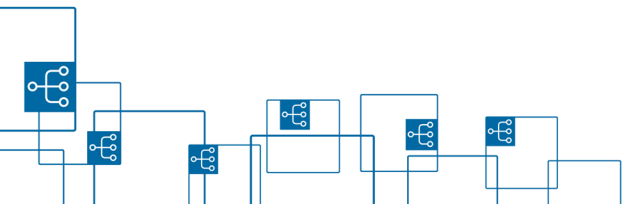
### Path Geometry

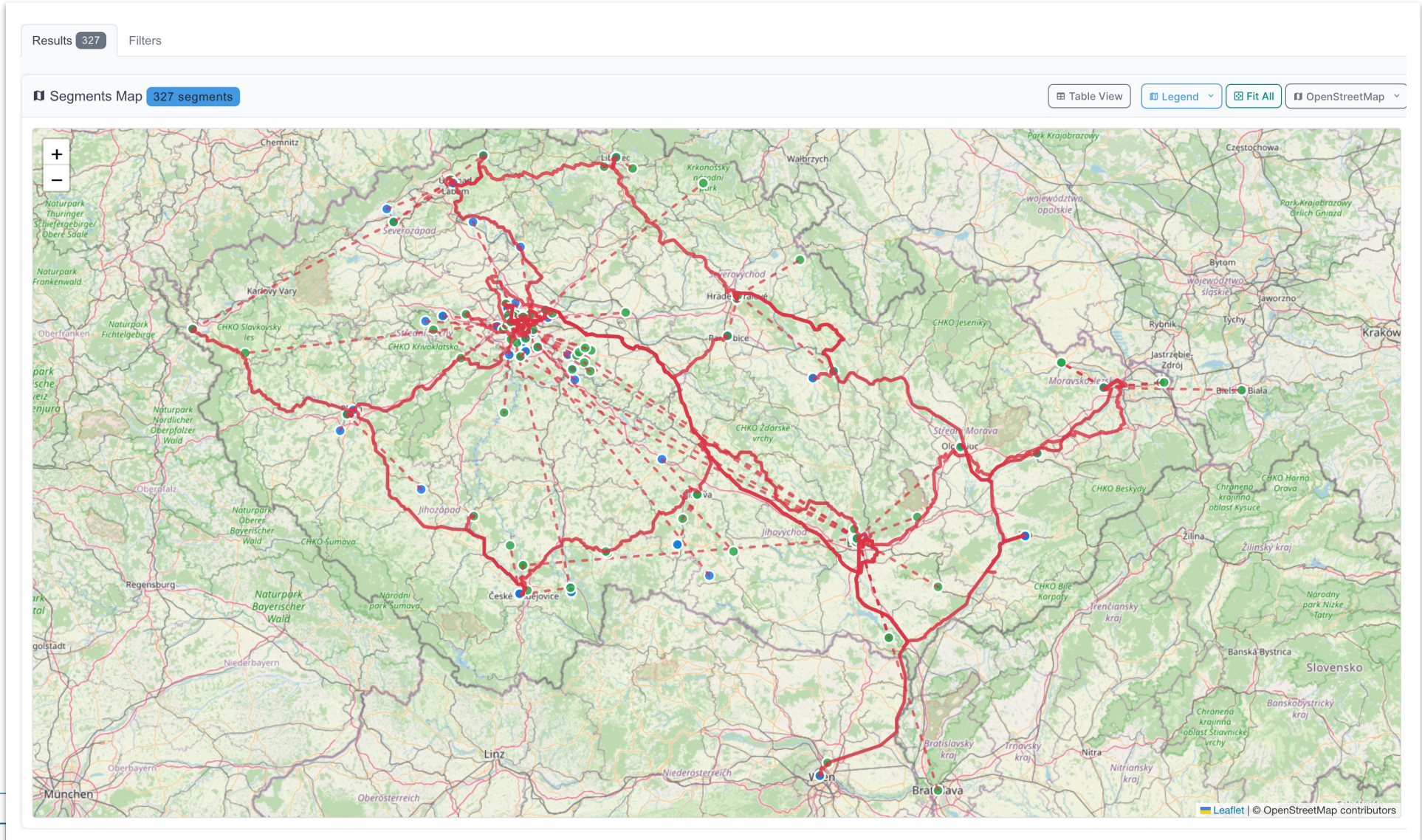
Path Geometry File  No file selected.

Upload a file containing the path geometry. Supported formats: GeoJSON (.geojson, .json), KML (.kml), KMZ (.kmz)

Path Notes

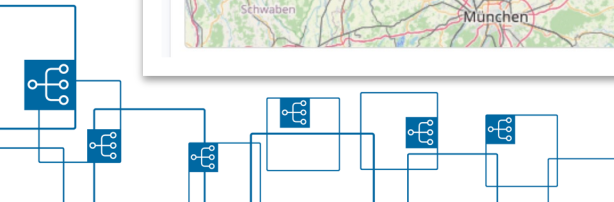
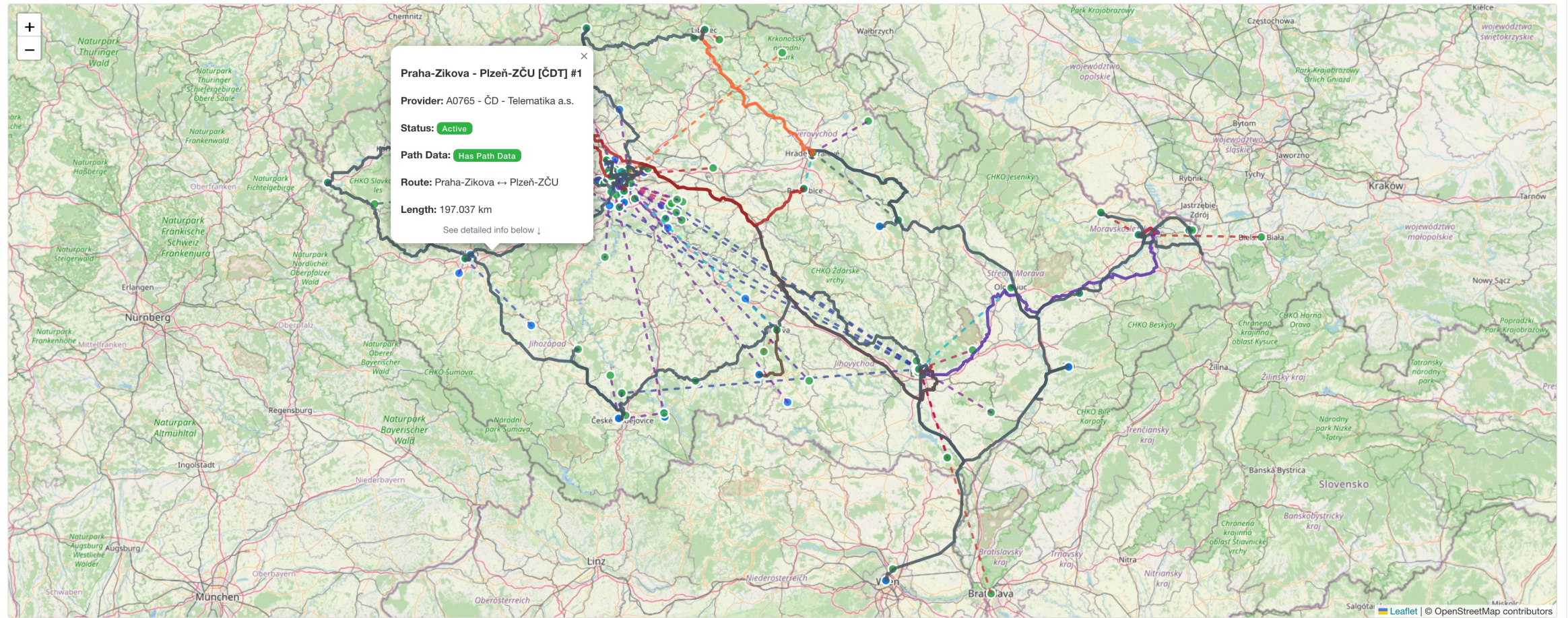
Additional notes about the path geometry





Segments Map 328 segments

Table View Provider Legend Fit All OpenStreetMap



**Segments** Map View + Add Import Export

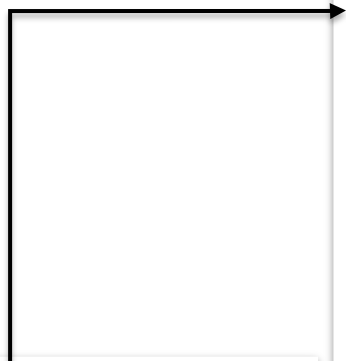
Results **9** Filters **1**

Tags: [DWDM] - Centrální okruh (9) Save

Quick search  Configure Table

Showing 1-9 of 9 Per Page

<input type="checkbox"/>	NAME	PROVIDER	SITE A	LOCATION A	SITE B	LOCATION B	STATUS	PROVIDER SEGMENT ID	TAGS
<input type="checkbox"/>	Bmo-VUT - Bmo-MUNI [VUT] #1	C070000 - Vysoké učení technické v Brně	Bmo-VUT	Sál 431	Bmo-MUNI	D109 "nový sál"	Active	—	[DWDM] - Centrální okruh [NET] - CESNET DWDM [TECH] - Cisco DWDM



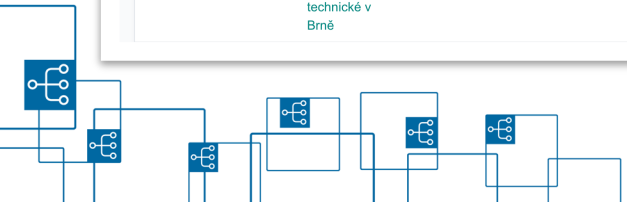
**Segments Map View** + Add Import Export

Results **9** Filters **1**

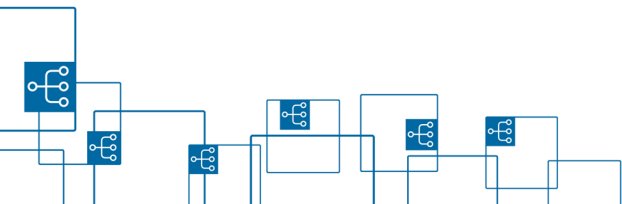
Tags: [DWDM] - Centrální okruh (9) Save

Segments Map **9 segments** Table View Provider Legend Fit All OpenStreetMap

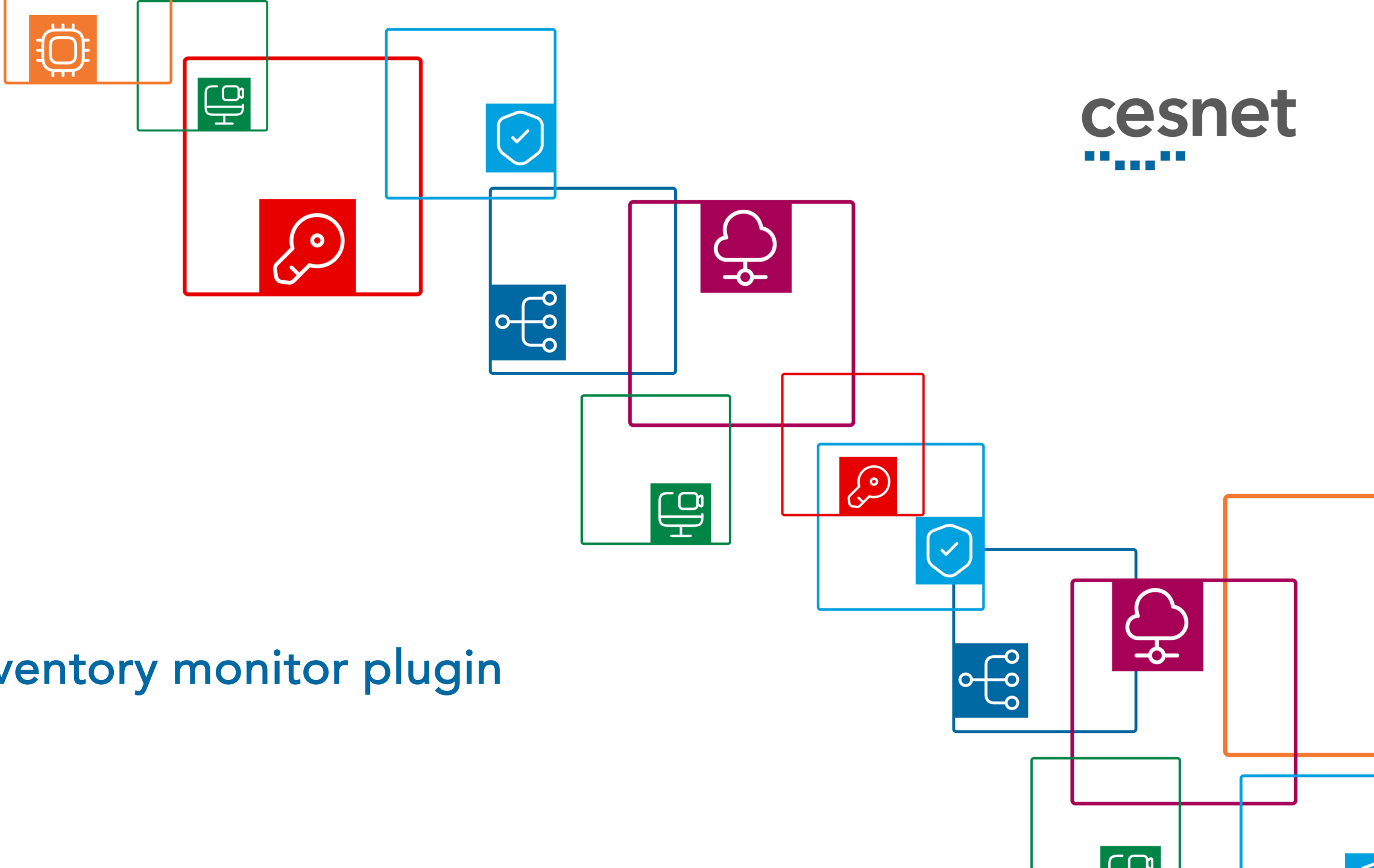
Map view showing a network of segments in purple on a map of the Czech Republic. The segments form a large loop connecting various cities like Brno, Olomouc, and Hradec Králové.



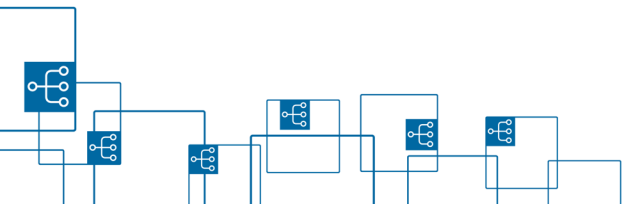
- Color coding by
  - Status
  - Provider
  - Type
  - and more in future
- Simple UI for saving GeoPath files
- Complete data of rented fibers and services
  - Work in progress:
    - Financial information
    - SLA



# Inventory monitor plugin



- Old system collected and stored inventory
- Not maintained
- Missing new functionality
- Decision to migrate into NetBox (in 2021)



- Current release is 3rd overhaul of plugin
- Connected to financial inventory system
- Preparing automatic inventory of physical objects

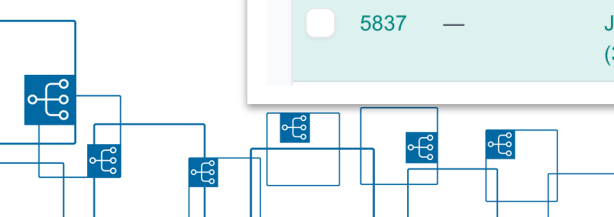
**Assets** + Add ↓ Export

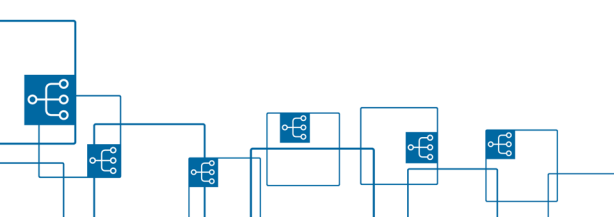
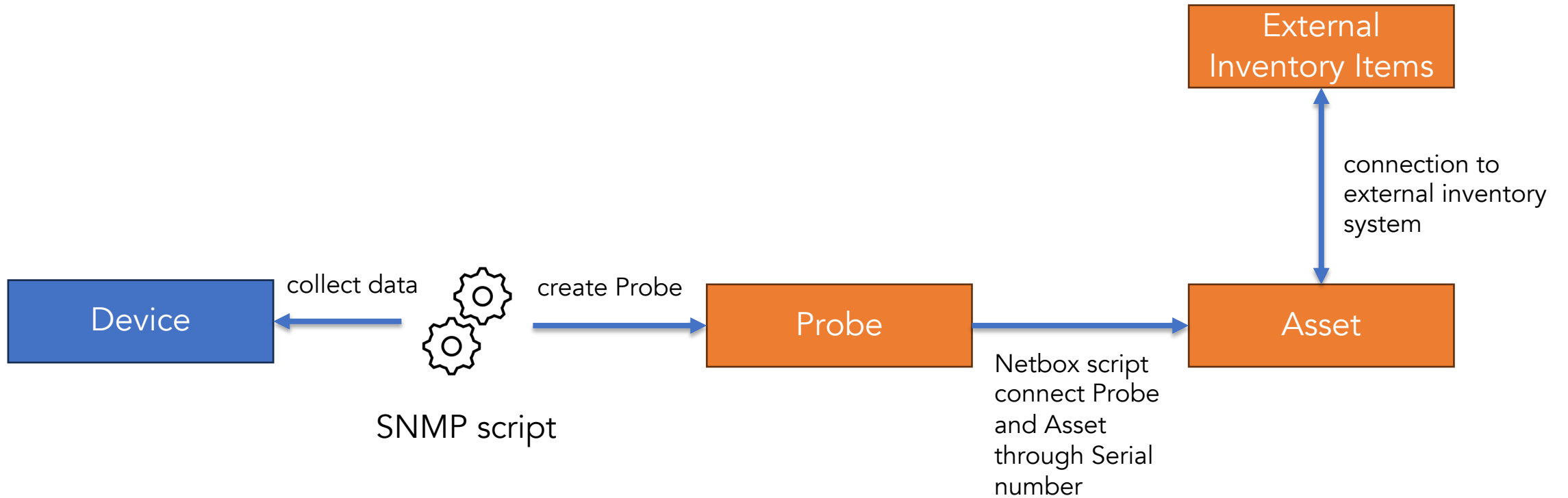
Results 8721 Filters

Quick search  ⚙ Configure Table ↓

< 1 2 3 4 ... 88 > Showing 101-200 of 8721 Per Page

<input type="checkbox"/>	ID	PARTNUMBER <span style="color: red;">✕</span>	SERIAL <span style="color: gray;">∨</span>	<span style="color: red;">✕</span> DESCRIPTION <span style="color: gray;">∨</span>	<span style="color: red;">✕</span> TYPE	ASSIGNED OBJECT	ASSIGNMENT STATUS	LIFECYCLE STATUS	PROBE STATUS	LAST PROBE	EXTERNAL INVENTORY ITEMS
<input type="checkbox"/>	7006	—	JAB023100L3	CISCO2611: CISCO 2611	—	SKLAD	Stocked	Retired	⊙ Stale	2009-09-02 07:05	T0121/0: CISCO2611: CISCO 2611 <span style="background-color: #ffc107; padding: 2px 5px;">✎</span>
<input type="checkbox"/>	7007	—	JAC0538A114	CISCO2621: CISCO 2621	—	SKLAD	Stocked	Retired	⊙ Stale	2006-03-01 06:05	L0142: CISCO2621: CISCO 2621 <span style="background-color: #ffc107; padding: 2px 5px;">✎</span>
<input type="checkbox"/>	5837	—	JAD05350K7V (3540919788)	2621 chassis	—	R71-CB (L0124)	Deployed	Retired	⊙ Stale	2023-02-27 01:14	L0124: CISCO2621: CISCO 2621 <span style="background-color: #ffc107; padding: 2px 5px;">✎</span>





## ✔ Import Probes for Device ⌵

Options:

device\_name:

nexus3

tag:

net-cesnet3

**Succeeded** 🚩 0:11:57 at Mon 4:33 pm ➤

you

🔑 a14bc3e6

#3521 ⌵

[Run Again](#) ↻

[Log Output](#) ➤

100% 1/1 COMPLETE

0 FAILED

0 INCOMPLETE

0 NOT STARTED

Node

Start time

Duration

spof

All Steps OK

0:11:57

1. new\_snmp\_v3.sh

OK

4:21:57 pm

0:00:06

```

14:22:00 2025-09-15 16:22:00 | INFO | __main__:collect_device_inventory:54 - Processing single device: nexus3
14:22:01 2025-09-15 16:22:01 | SUCCESS | inventory_monitor.snmp:snmp_session:169 - nexus3 (10.3.1.17): SNMPv3 connection successful
14:22:03 2025-09-15 16:22:03 | INFO | inventory_monitor.invmon:process_device:160 - nexus3: Processed
14:22:03 2025-09-15 16:22:03 | INFO | inventory_monitor.netbox:create_or_update_probe:210 - Updated existing probe for serial ART2231FBL7
14:22:03 2025-09-15 16:22:03 | INFO | inventory_monitor.netbox:create_or_update_probe:210 - Updated existing probe for serial ART2231FBU5
14:22:03 2025-09-15 16:22:03 | INFO | inventory_monitor.netbox:create_or_update_probe:210 - Updated existing probe for serial FOC22380XJT
14:22:03 2025-09-15 16:22:03 | INFO | inventory_monitor.netbox:create_or_update_probe:210 - Updated existing probe for serial AVM2234U59R
14:22:03 2025-09-15 16:22:03 | SUCCESS | __main__:process_device_inventory:87 - Inventory processed for device: nexus3, platform: nxos_ssh, manufacturer: Cisco
  
```

2. new\_snmp\_v3\_des

OK

4:22:04 pm

0:05:05

3. old\_snmp\_v3.sh

OK

4:27:09 pm

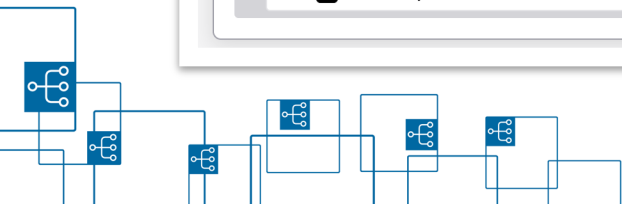
0:00:02

4. old\_snmp\_v2.sh

OK

4:27:12 pm

0:06:42



## Specific asset object

Assets inv

**NCS2015-SA-AC (SAL23020043)** Add Attachment Bookmark Subscribe + Add

Created 2023-03-06 13:21 · Updated 2025-09-17 05:00

Asset Attachments **Probes 4** Images Journal Changelog

Device: [NCS 2015 Brno 1 \(T05685\)](#) Serial Number: [SAL23020043](#)

Quick search

Showing 1-4 of 4

ID	LAST PROBE TIME	CREATION TIME	NAME	DEVICE	SITE	LOCATION	PROBE STATUS
28329	2025-09-17 07:16 6 hours, 16 minutes ago	2024-09-21 02:06:05	BACKPLANE_M15	NCS 2015 Brno 1 (T05685)	Brno-MUNI	A510	<span>Recent</span>
27502	2024-09-20 02:06 11 months, 4 weeks ago	2024-02-02 01:59:23	BACKPLANE_M15	NCS 2015 Brno 1 (T05685)	Brno-MUNI	D109 "nový sál"	<span>Stale</span>
8872	2024-02-01 02:59 1 year, 7 months ago	2022-09-09 12:50:28	BACKPLANE_M15	NCS 2015 Brno 1 (T05685)	Brno-MUNI	—	<span>Stale</span>
11915	2023-01-15 19:05 2 years, 8 months ago	2021-02-06 06:05:01	BACKPLANE_M15	—	—	—	<span>Stale</span>

Showing 1-4 of 4

## Script

pts / Asset\_lifecycle\_manager / ImportAssets / 2025-09-15 16:24:11

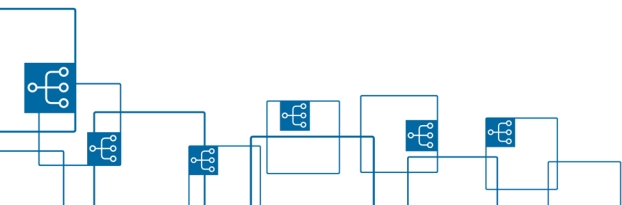
Results

threshold Info Configure Table

Completed: 2025-09-15 16:24:11 Duration: 0 minutes, 27.87 seconds Completed

Showing 1-100 of 1839 Per Page

LINE	TIME	LEVEL	OBJECT	MESSAGE
1	2025-09-15T14:24:12.774665+00:00	Info	—	Device: NCS 2015 Olomouc 2, Serial: JFP2415R030, Description: AD_16_FS_LINE_CARD
2	2025-09-15T14:24:13.421792+00:00	Success	—	Probe information updated in Asset
3	2025-09-15T14:24:13.429451+00:00	Info	—	Changelog deleted
4	2025-09-15T14:24:13.432504+00:00	Info	—	Device: NCS 2015 Praha 2, Serial: JFP2418R008, Description: AD_16_FS_LINE_CARD
5	2025-09-15T14:24:13.461076+00:00	Success	—	Probe information updated in Asset



Devices / Brno-MUNI dcim.device:174

**NCS 2015 Brno 1 (T05685)** 
[Add Attachment](#)
[+ Add Components](#)
[Bookmark](#)
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[Import](#)
[Export](#)

Created 2022-01-21 01:00 · Updated 2025-06-11 17:57 EPNM

Device Module Bays 25 Interfaces 23 Power Ports 4 Attachments Assets 48 BGP Connections LLDP Neighbors Authorized Keys Config Context Render Config Contacts Images

Journal Changelog

---

Device Serial: SAL23020043

Quick search [Configure Table](#)

Showing 1-48 of 48 Per Page

ID	PARTNUMBER	SERIAL	DESCRIPTION	TYPE	ASSIGNED OBJECT	ASSIGNMENT STATUS	LIFECYCLE STATUS	PROBE STATUS	LAST PROBE	EXTERNAL INVENTORY ITEMS
4561	CPAK-100G-SR10	FBN19302448	PPM_1_PORT	—	NCS 2015 Brno 1 (T05685)	Deployed	Retired	Stale	2023-01-15 19:05	
5190	NCS2015-ECU	SAL231200KY	ECU_FMEC_SLOT	—	NCS 2015 Brno 1 (T05685)	Deployed	In Use	Recent	2025-09-17 07:16	
5188	NCS2015-FTA	SAL225000NR	FAN_UTS	—	NCS 2015 Brno 1 (T05685)	Deployed	In Use	Recent	2025-09-17 07:16	
5185	NCS2015-SA-AC	SAL23020043	BACKPLANE_M15	—	NCS 2015 Brno 1 (T05685)	Deployed	In Use	Recent	2025-09-17 07:16	T05685: CISCO NCS 2015
4661	NCS2K-200G-CK-LIC	CAT1935B1TQ	CISCO NCS2K-200G-CK-LIC: CISCO NCS 2000 200-GBPS MULTIRATE DWDM	—	NCS 2015 Brno 1 (T05685)	Deployed	Retired	Stale	2023-01-15 19:05	T5037: CISCO NCS2K-200G-CK-LIC: CISCO NCS 2000 200-GBPS MULTIRATE DWDM LINE CARD

Probe state

Stale

2023-01-15  
19:05

Not probed recently or never

Recent

2025-09-17  
07:16

Probed within last 7 days

External inventory Item

Sites / CZ / Jihomoravský kraj / Brno-město / Brno

dcim.site:19 (brno-muni)

## Brno-MUNI

Created 2021-09-15 02:00 · Updated 2025-09-17 13:00

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[Assets 160](#)
[Floor Plan](#)
[Contacts](#)
[Images](#)
[Journal](#)
[Changelog](#)

Quick search

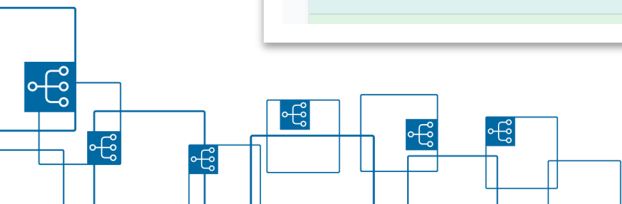
Configure Table

1 2 >

Showing 1-100 of 160

Per Page

<input type="checkbox"/>	ID	PARTNUMBER	SERIAL	DESCRIPTION	TYPE	ASSIGNED OBJECT	ASSIGNMENT STATUS	LIFECYCLE STATUS	PROBE STATUS	LAST PROBE	EXTERNAL INVENTORY ITEMS	<input type="checkbox"/>
<input type="checkbox"/>	6344	—	ALD1533A3X3	Switch 1 - WS-C3750G-24TS-1U - Power Supply 0	—	Cat48	Deployed	Retired	Stale	2023-04-21 03:36		<input type="checkbox"/>
<input type="checkbox"/>	6345	—	AZS1040023L	Switch 1 - WS-C3750G-24TS-1U - Power Supply 0	—	Cat68-Vyskov	Deployed	Retired	Stale	2023-04-19 11:20		<input type="checkbox"/>
<input type="checkbox"/>	8128	—	DW67011	—	—	DWDM-BRNMUN-A510-MD (VUT) (T5203)	Deployed	In Use	Stale	Never	T5203: 40-CH ATHERMAL AWG 100GHZ, 20-50CH, MUX+DEMUX, 2FIBER, LC/PC, 1U	<input type="checkbox"/>
<input type="checkbox"/>	10124	—	FDO26141PEV	Chassis	—	S3c-new (T05850)	Deployed	In Use	Recent	2025-09-17 04:13	T05850: CATALYST 9500-32C	<input type="checkbox"/>



## Network Changes

Date From\* 2025-01-01

Date To\* 2025-09-17

Device\* R1

Changelog message

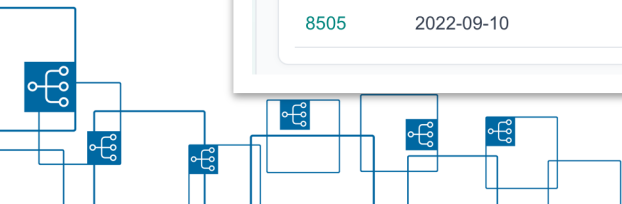
### Added Items

Submit Reset

ID	Creation Time	Last Seen (Time)	Name	Serial	Part	Site	Location	Device
29254	2025-08-27	2025-09-17	HundredGigE0/0/1/16-IDPROM	FTF2612N0AD	QSFP-40/100-SRBD	Praha-Zikova	č.95	R1
28669	2025-01-10	2025-09-17	HundredGigE0/0/1/19-IDPROM	FTF2622N6JZ	QSFP-40/100-SRBD	Praha-Zikova	č.95	R1

### Removed Items

ID	Creation Time	Last Seen (Time)	Name	Serial	Part	Site	Location	Device
26866	2023-07-07	2025-01-09	HundredGigE0/0/0/6-IDPROM	INL260206XH	QSFP-100G-LR4-S	Praha-Zikova	č.95	R1
8480	2022-11-02	2025-01-09	HundredGigE0/0/0/7-IDPROM	INL26020728	QSFP-100G-LR4-S	Praha-Zikova	č.95	R1
8505	2022-09-10	2025-08-20	HundredGigE0/0/1/16-IDPROM	FTF2622N4B2	QSFP-40/100-SRBD	Praha-Zikova	č.95	R1

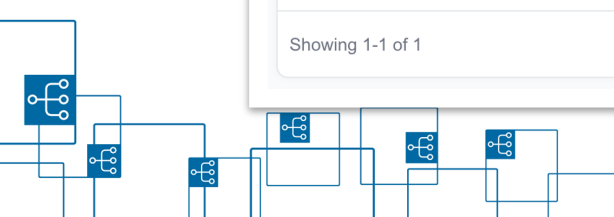


- It's possible to track RMA on asset
- RMA object links old and new probes for Asset

### Asset probes after RMA

SERIAL	PART	PROBE STATUS
JUC1205P226	PID=; PartNum=800-22243-06	Stale
JUC1205P226	PID=N/A; PartNum=800-22243-06	Stale
JUC1205P226	800-22243-06	Stale
BKS10320012	800-22243-04	Stale
BKS10320012	800-22243-04	Stale

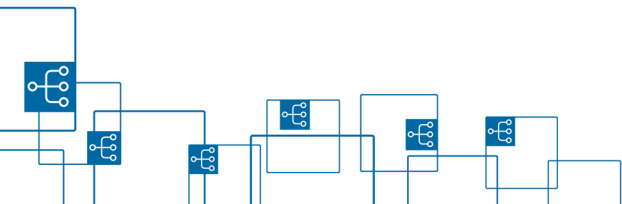
RMA's								<a href="#">RMA's List</a>	<a href="#">+ Add RMA</a>
ID	RMA NUMBER	ASSET	ORIGINAL SERIAL	REPLACEMENT SERIAL	STATUS	DATE ISSUED	DATE REPLACED		
1	—	15454-OPT-PRE (JUC1205P226)	BKS10320012	JUC1205P226	Completed	—	—	<a href="#">✎</a>	



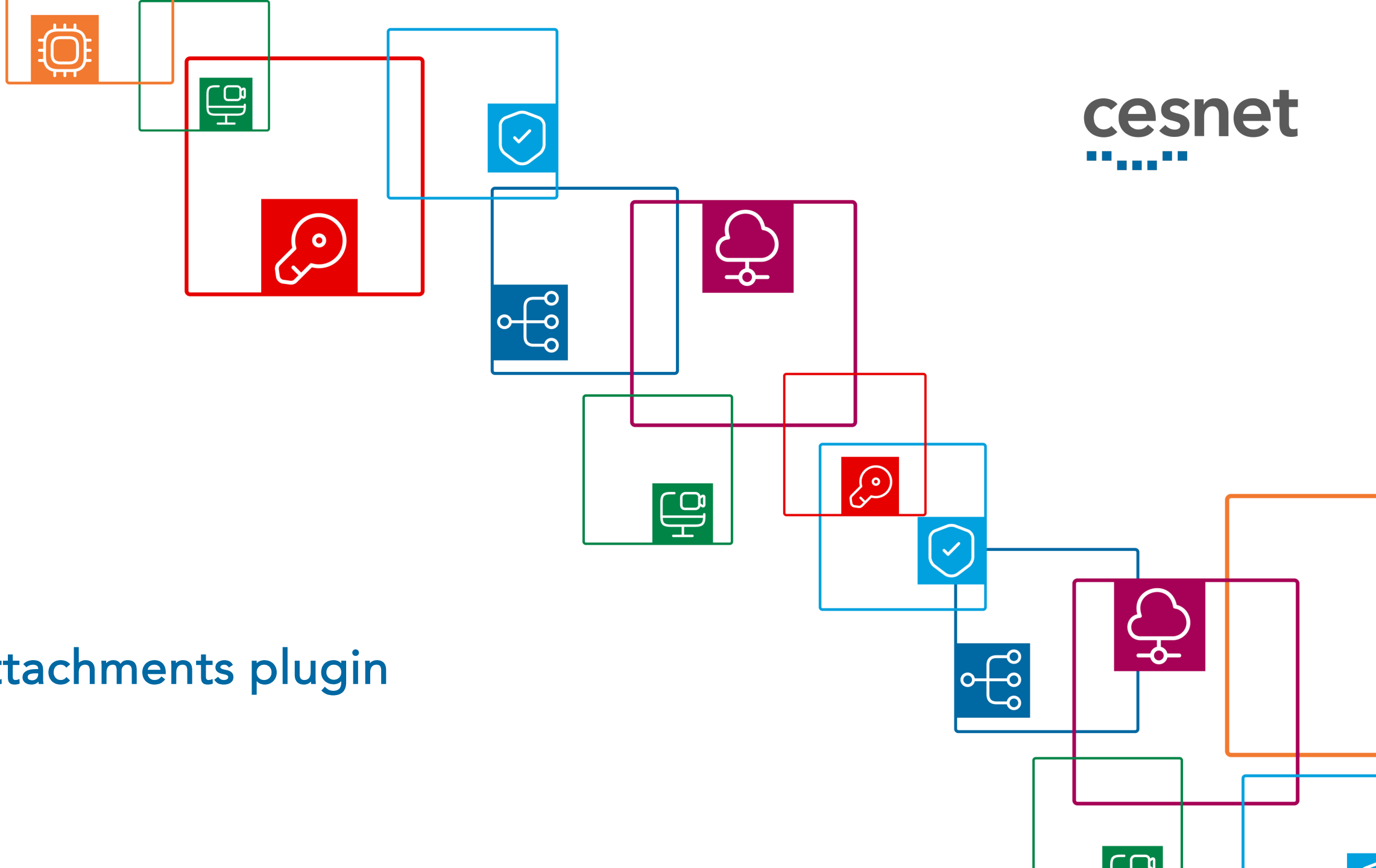
- Automatically collect inventory data
- Pair physical devices with financial inventory
- See network changes on device
- Track RMA, invoices, services ...



 SNMP script not part of public repository



# Attachments plugin



- Store any file type in NetBox
- You can add files even to plugin objects

Segments cesnet\_service\_path\_plugin.segment:224

### Praha-DC Tower - Praha-Slovanka [T-Mobile]

#1  
Created 2024-07-10 13:42 · Updated 2025-09-09 16:30

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Segment **Attachments 5** Journal Changelog

Quick search Configure Table

Showing 1-5 of 5 Per Page

NAME	DESCRIPTION	OBJECT TYPE	TAGS	
16579v1.doc	—	Segment	—	<a href="#">Download</a> <a href="#">Edit</a>
2023-0211_Smlouva_pronajem-vlaken_DC-Tower_AVCR-Slovanka_final.pdf	—	Segment	—	<a href="#">Download</a> <a href="#">Edit</a>
Průběh trasy	—	Segment	—	<a href="#">Download</a> <a href="#">Edit</a>
measprotocol-POO_16579_v1.pdf	—	Segment	—	<a href="#">Download</a> <a href="#">Edit</a>
predavaci_protokol-P332846-K508347_Slovanka_MM.pdf	—	Segment	—	<a href="#">Download</a> <a href="#">Edit</a>

Showing 1-5 of 5 Per Page

[+ Add Attachment](#)





Segments



Inventory

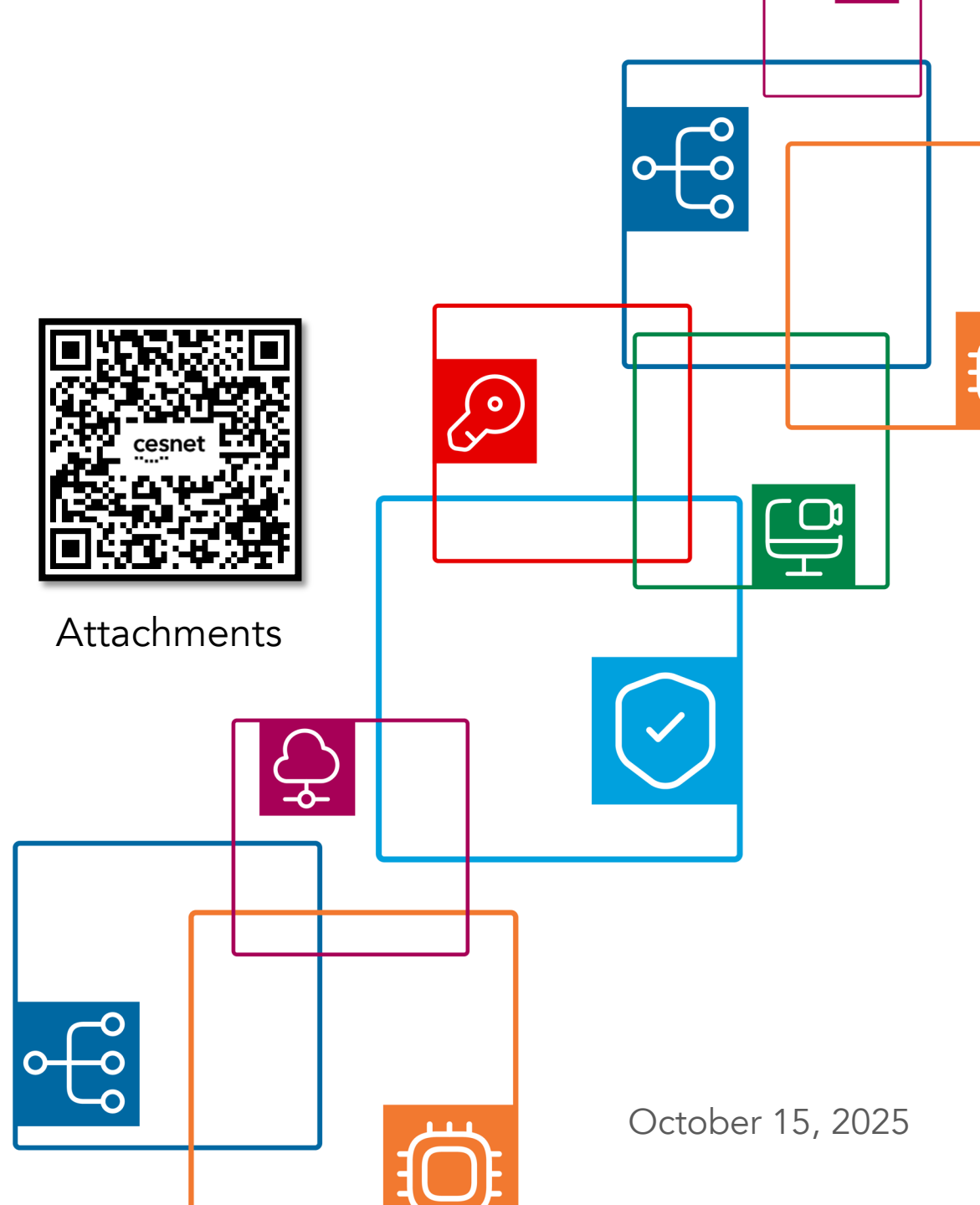


Attachments

Thank you!  
Any questions?

Ladislav Loub  
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