

# AS/IXP Traffic Observability with ntop

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# Who Am I

- Luca is the founder of ntop a European company (Italy and Switzerland) established 25+ years ago that develops open-source network security and visibility tools.
- He is the contributor to various open-source software tools (e.g. Wireshark and Suricata) and a lecturer at the CS Department of the University of Pisa, Italy.
- The github code repository for the tools presente in this talk is <https://github.com/ntop/>



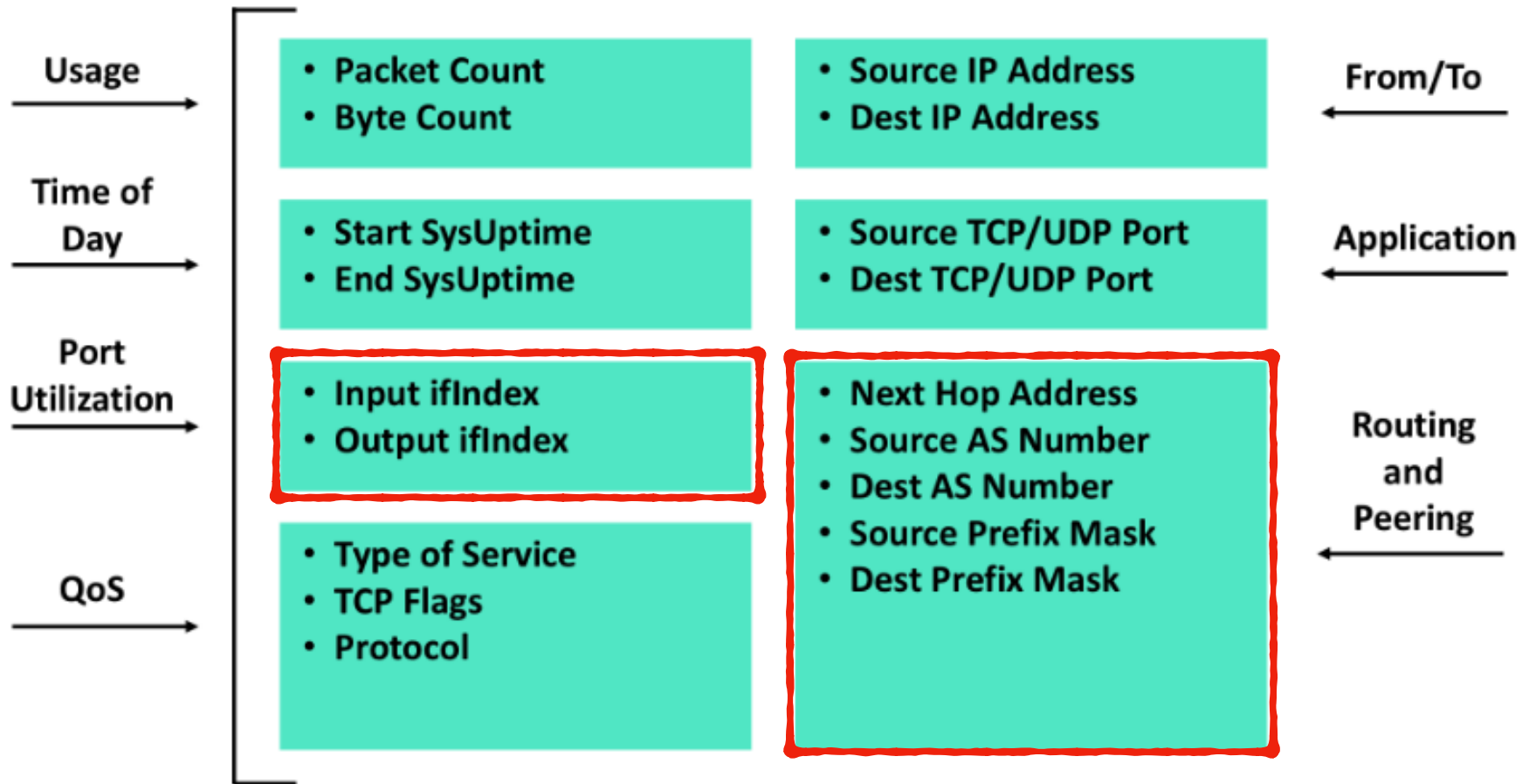
# Everything Started One Year Ago

- Network traffic visibility is often **optional** for network operators:
  - Lack of a law requiring permanent visibility.
  - When a problem arises, a "manual" analysis is performed.
  - Lack of time to analyze telemetry data.
  - Expensive network visibility solutions with monthly recurring costs, cloud-based (data sovereignty).
- Why not do something to change all this?

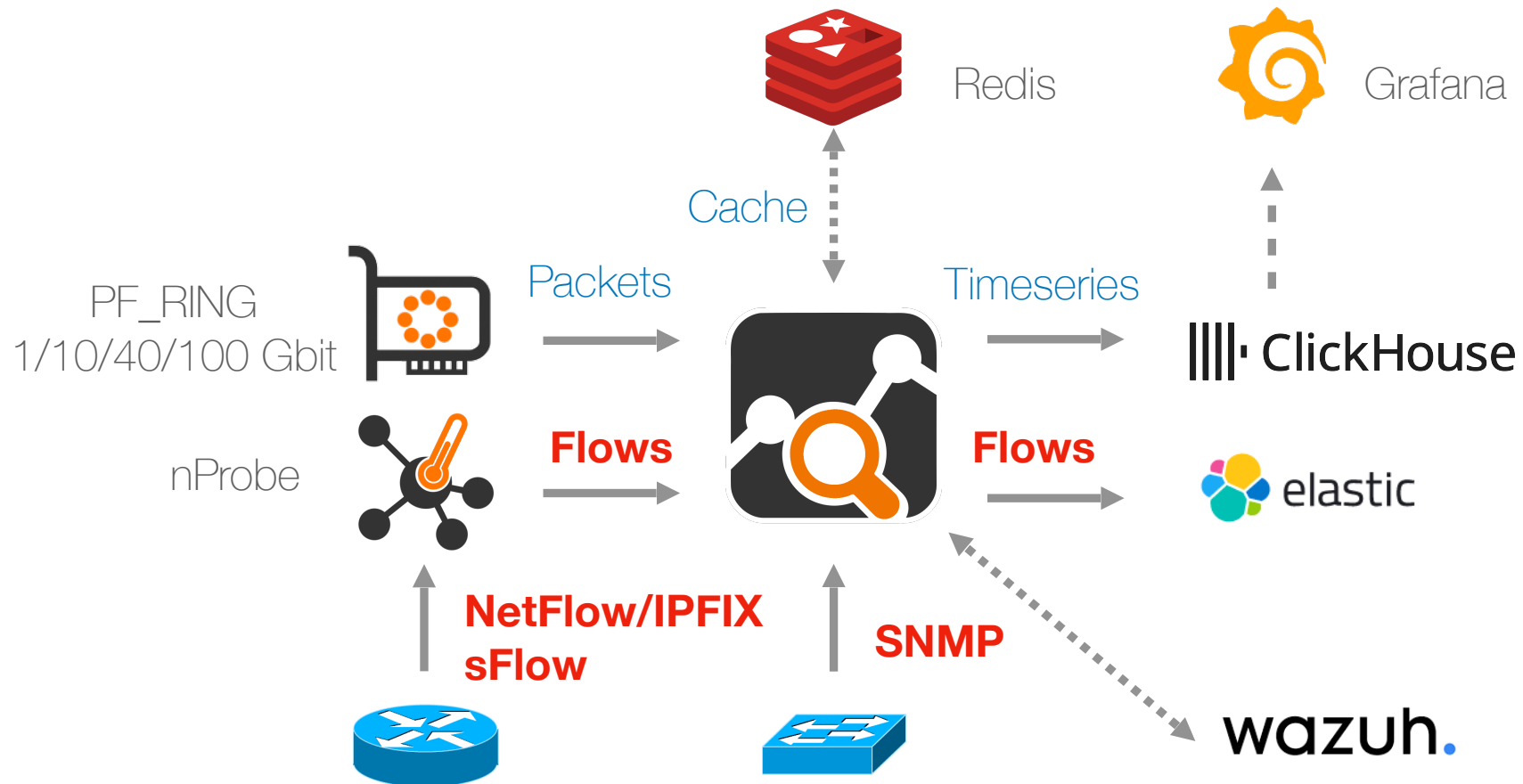
# Goal of This Presentation

- Show you what we have implemented for network visibility.
- Trigger your interest so you reply our tools in your network.
- Show what happens on your network without using costly or cloud-based tools (Data belongs to you !).
- What we would like to have back
  - Feedback: we want to improve and learn what's missing.
  - Collaboration on monitoring/visibility/cybersecurity problems where our tools and your expertise can fit.

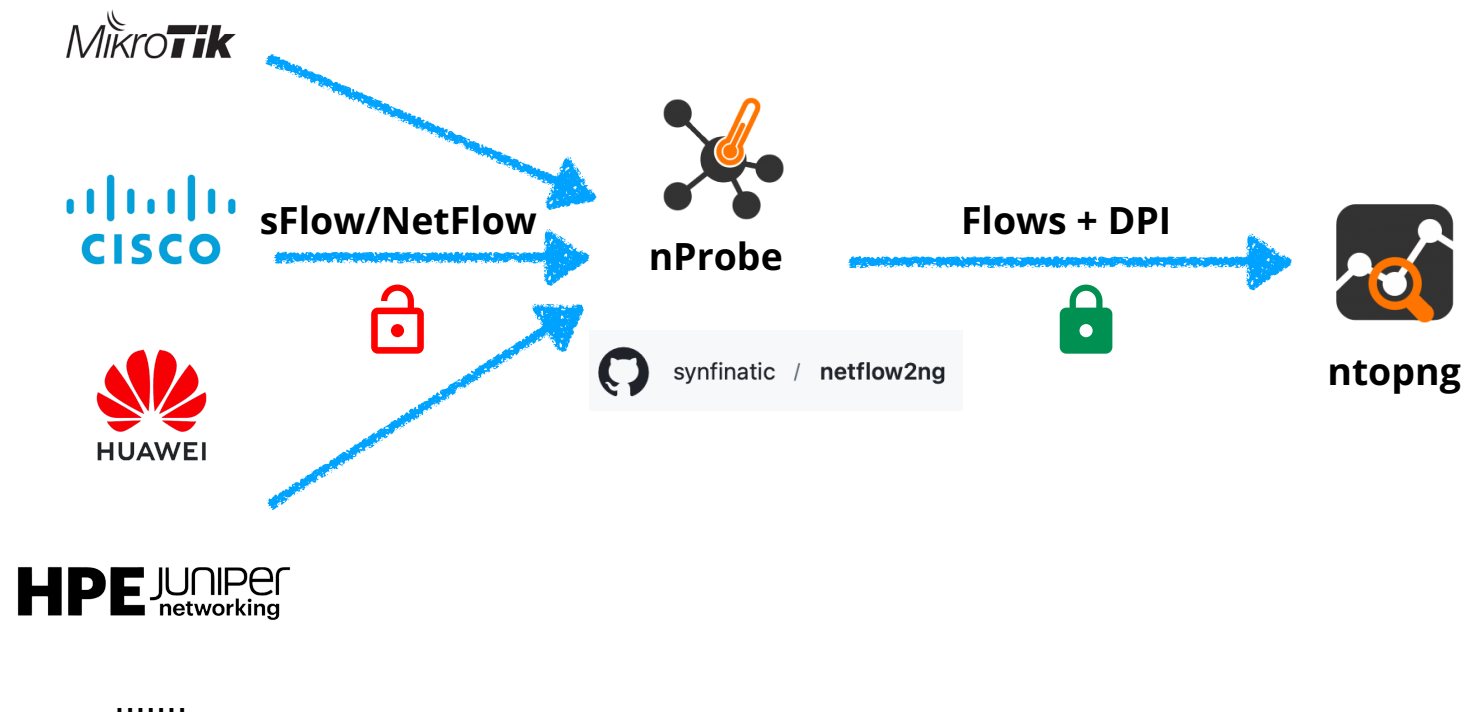
# What is a Network Flow ?



# ntopng Architecture



# Network Flow Collection



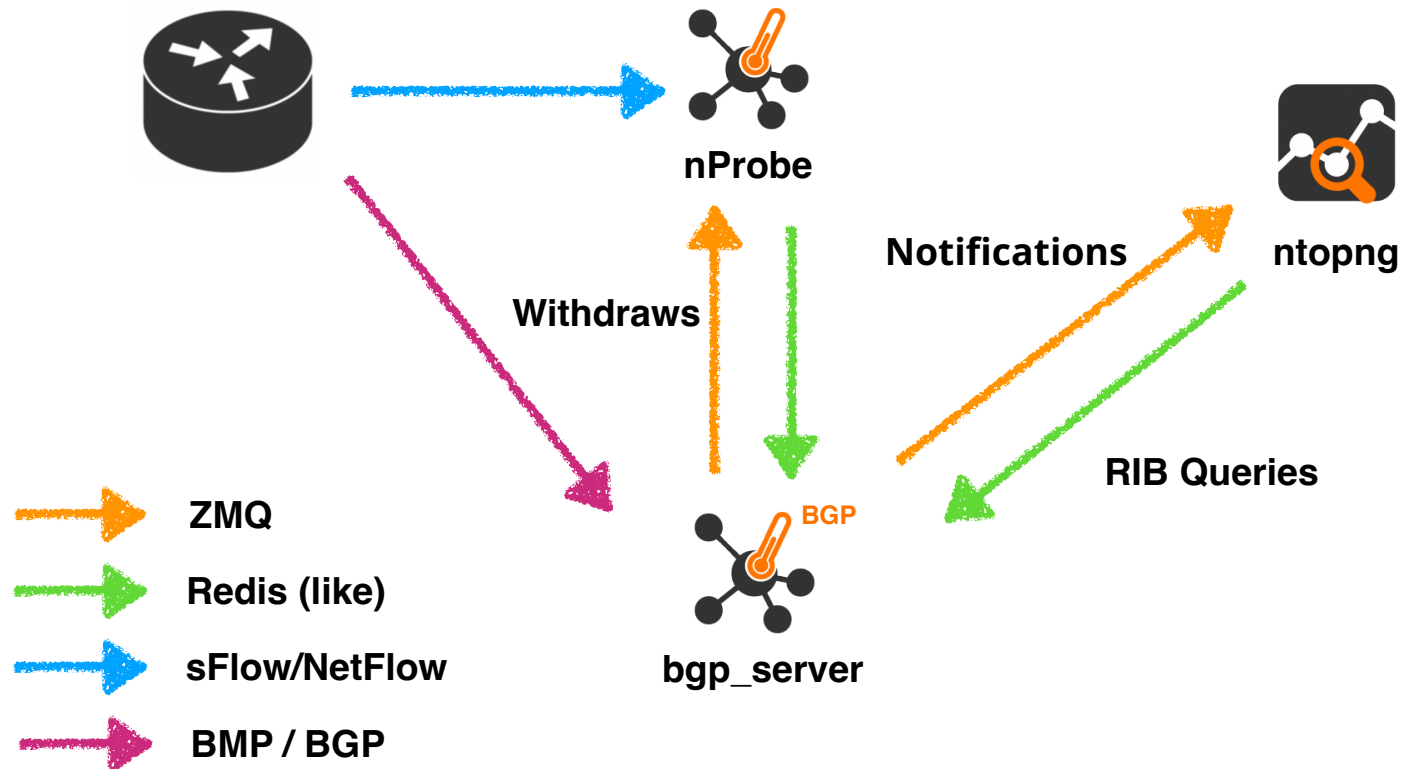
# One Year Later



# Our Principles

- Creation of an **open source**, on-premise, "Made in Europe" application, with a **free community edition available to everyone**, and an enterprise edition (with premium support) for covering development costs.
- Network analysis based on flows sent by network devices, lightweight DPI, and packet analysis capabilities.
- Scalability across multiple routers (100+), multiple 100-GB routers.
- Vendor-neutral: support for standard SNMP, sFlow/NetFlow/IPFIX protocols, and various "dialects".

# BGP/BMP Integration



# Configuration [1/2]



## My ASNs

62275,58113

Comma separated list of ASNs, that belong to this organization.

## Customer ASNs

34978,200547,61182,204386,209529,206022,208919,12654,31686,34382,50877,58154,8038,57771,204471,204958,207054,209757,210598,210826,212686,214443,211360,57698,56781,208076,211411,208753,212539,208584,208242,215795,54334,215899,215146,211729,207466,212510,213573,39479,42180,202523,3

Comma separated list of Customer ASNs, interconnected to the Internet via my ASNs.

## Relevant Remote ASNs

16509,396982,13335,19551,8075,14618,54113,15169,54994,209242,40509,139341,15967,60068,21859,16625,16276,24429,47583,14061,202492,199524,31898,45102,132203,32934,2906,40027,8234,48634,5400,8968,11251,22604,23344,23258

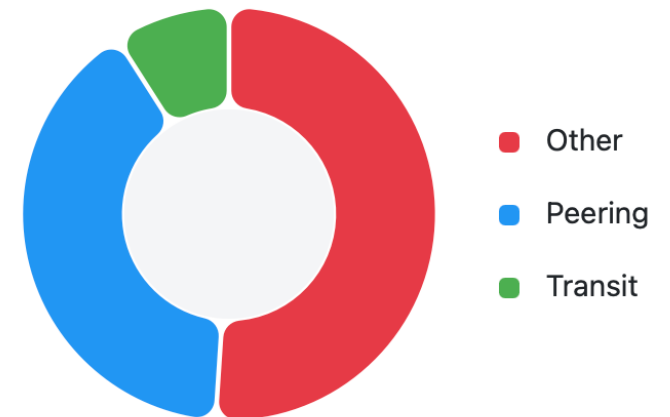
Comma separated list of Remote ASNs that are relevant for the monitoring standpoint.

Save Settings

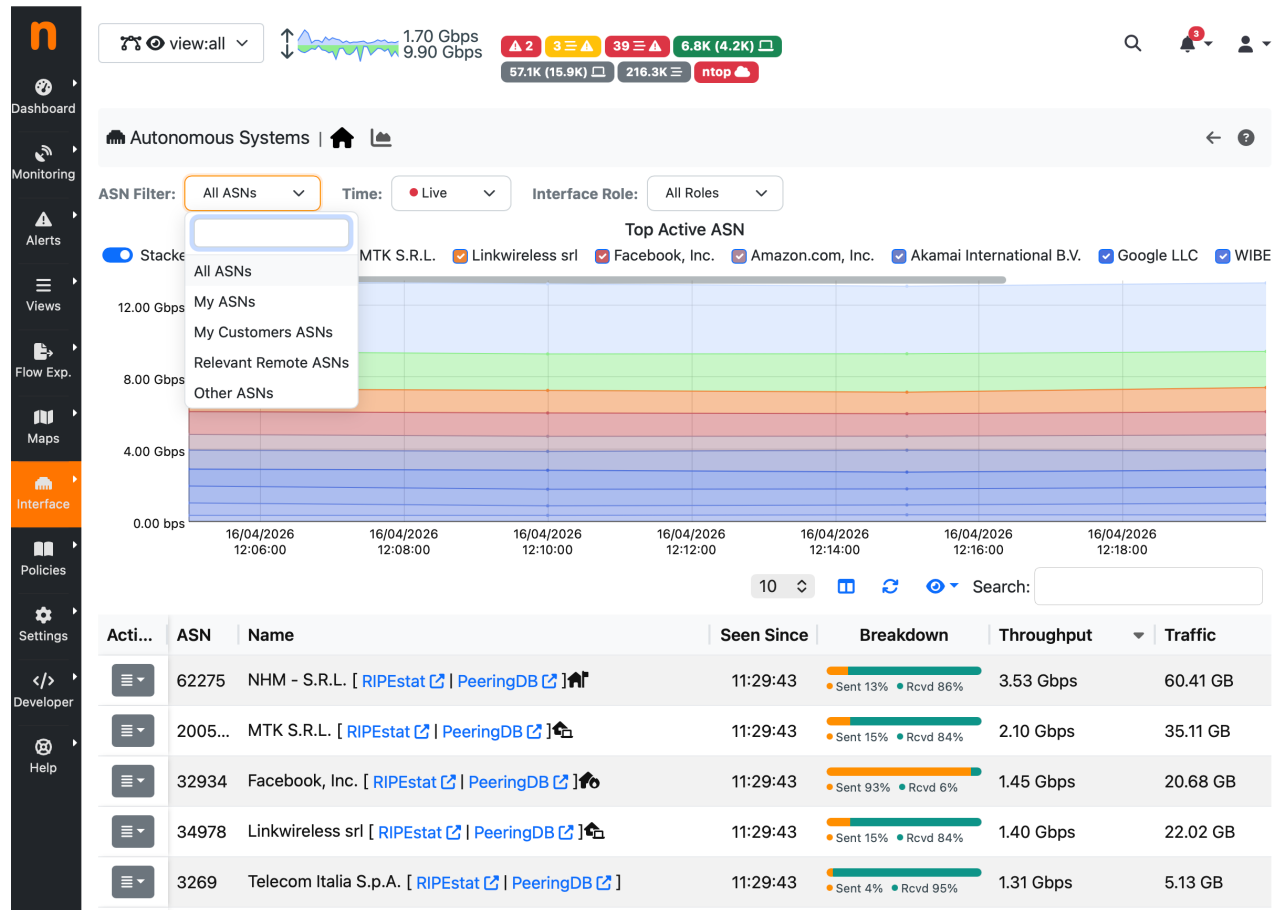
# Configuration [2/2]

|                                                                                                                                                                                                                                    |                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Interface Operational Status Change Alerts</b><br>Toggle alerts generated when an interface operational state changes                                                                                                           | <input checked="" type="checkbox"/>                                                                                                           |
| <b>Interface Duplex Status Change Alerts</b><br>Toggle alerts generated when an interface duplex status changes                                                                                                                    | <input checked="" type="checkbox"/>                                                                                                           |
| <b>Interface Discards/Errors Alerts</b><br>Toggle alerts generated when the discards or errors counters on an interface increase                                                                                                   | <input type="checkbox"/>                                                                                                                      |
| <b>Port Role</b><br>SNMP interface port role                                                                                                                                                                                       | <div>Customer<br/>IX (Internet Exchange)<br/>Internal LAN<br/>Internet Connectivity (Uplink)<br/>Other<br/><b>✓ Peering</b><br/>Transit</div> |
| <b>Exclude From Usage</b><br>By default, all the devices/interfaces are included in the SNMP Usage Page, if the user is not interested in analyzing this device/interface, enable this preference to remove it from the Usage Page | <input type="checkbox"/>                                                                                                                      |
| <b>Uplink (Out) Speed</b><br>Advertised Interface Speed: 0.00 Gbit                                                                                                                                                                 | <div>1.00 <input type="text"/> Gbit <span>Reset Speed</span></div>                                                                            |
| <b>Downlink (In) Speed</b><br>Advertised Interface Speed: 0.00 Gbit                                                                                                                                                                | <div>1.00 <input type="text"/> Gbit <span>Reset Speed</span></div>                                                                            |

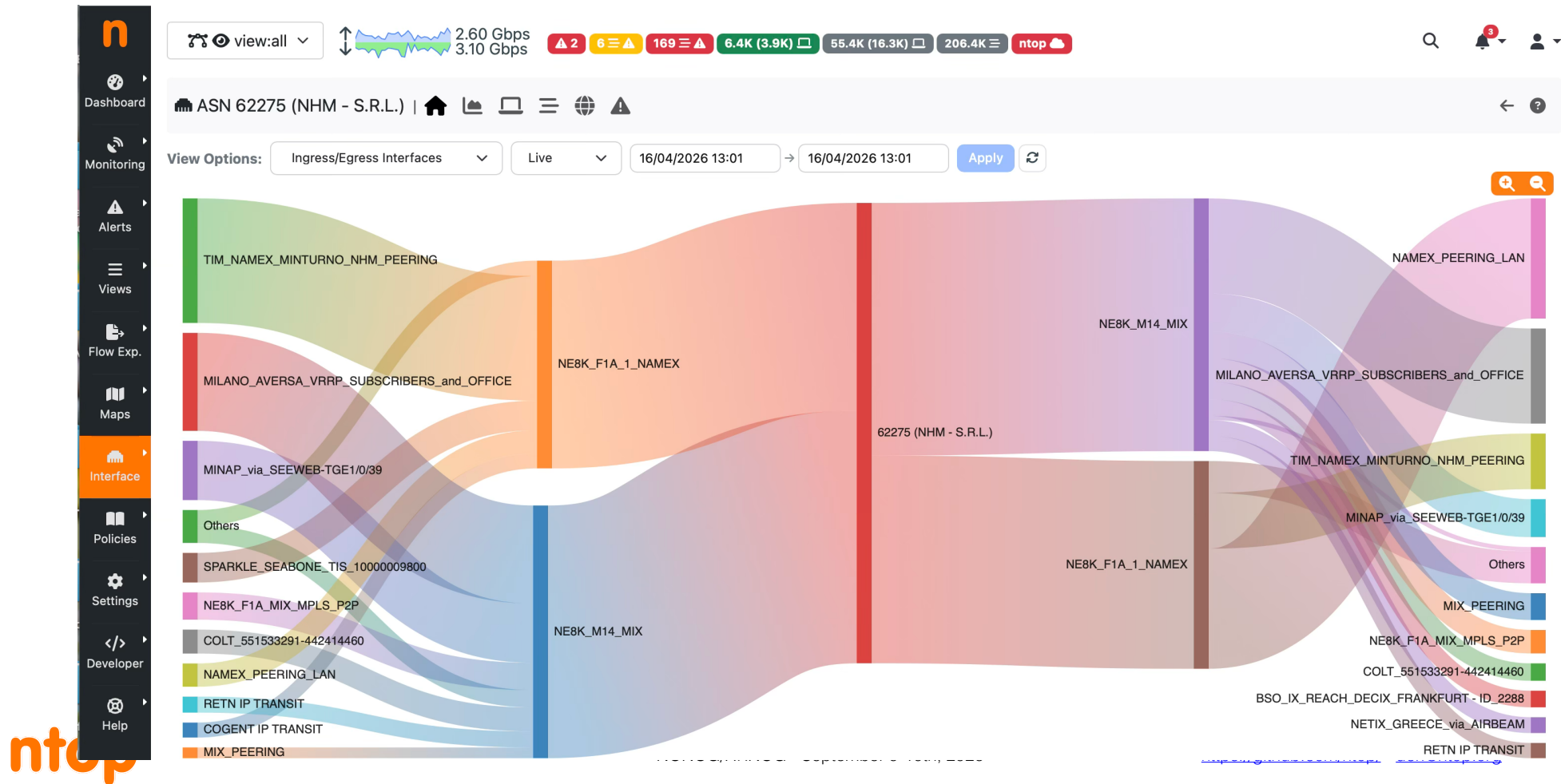
## Traffic Roles



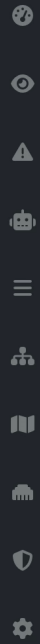
# Visibility: ASN



# Visibility: Routers and Interfaces



# Flows: BGP Information



IPFIX/sFlow **ZMQ**



↑ 208.70 Mbps  
↓ 1.70 Gbps

346 

1.3K (297) 

13K (10.2K) 

290 

16.2K 

Flow:   BGP

**BGP Client Info**

|                               |                                                                                                  |
|-------------------------------|--------------------------------------------------------------------------------------------------|
| Prefix                        | 185.54.80.0/22  |
| BGP Peer Id                   | <a href="#">185.54.80.2</a> (netengine01 - Default)                                              |
| BGP Peer ASN                  | <a href="#">202032</a> (GOLINE - GOLINE SA)                                                      |
| Origin                        | IGP                                                                                              |
| Next Hop                      | 185.54.80.2                                                                                      |
| AS Path                       |                                                                                                  |
| MED (Multi-Exit Discrimina... | 0                                                                                                |
| Local Pref.                   | 40000                                                                                            |
| Communities                   | 64555:10000                                                                                      |

**BGP Server Info**

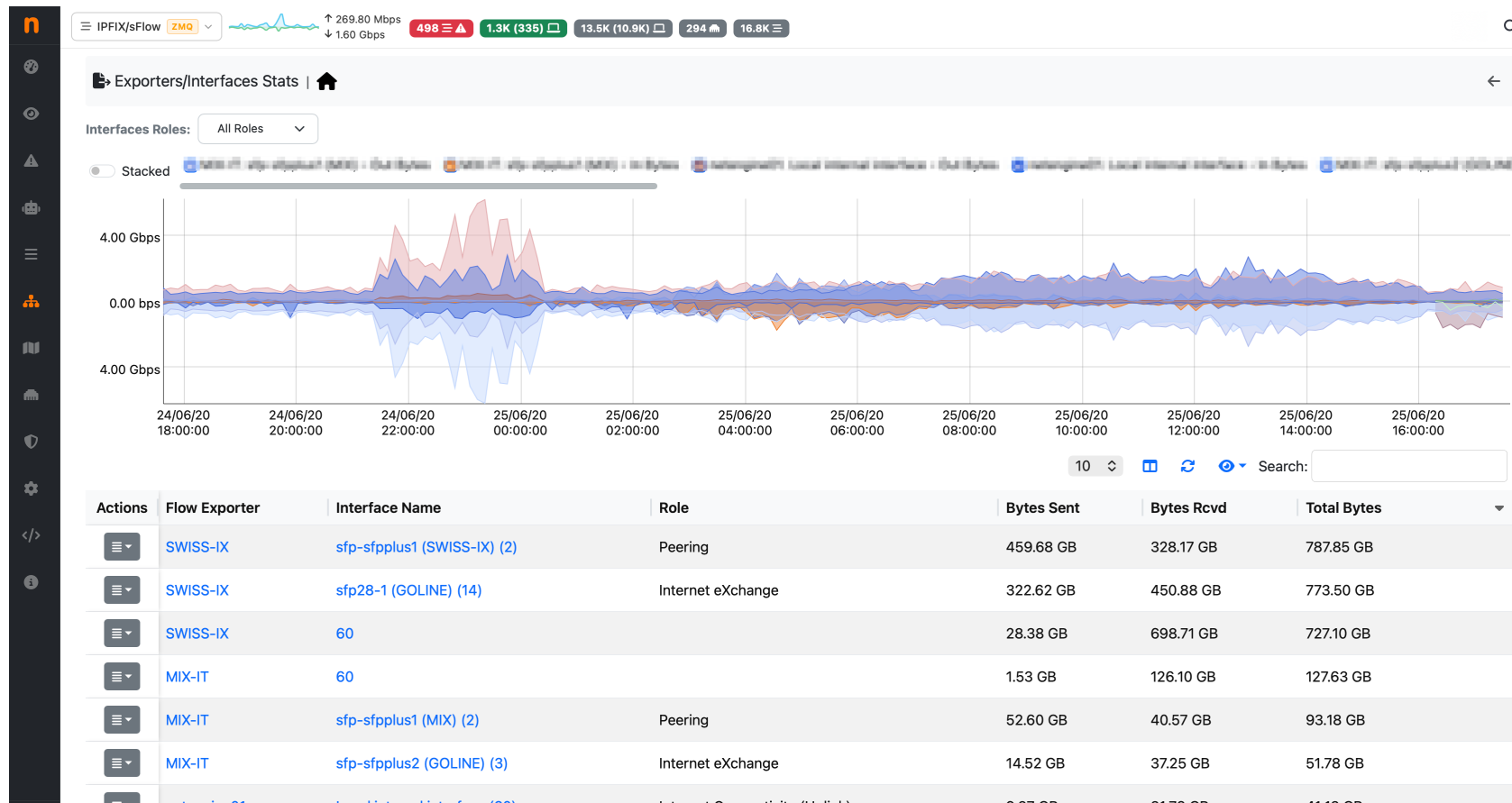
|                               |                                                                                                   |
|-------------------------------|---------------------------------------------------------------------------------------------------|
| Prefix                        | 54.216.0.0/15  |
| BGP Peer Id                   | <a href="#">185.54.80.3</a> (SWISS-IX - Default)                                                  |
| BGP Peer ASN                  | <a href="#">202032</a> (GOLINE - GOLINE SA)                                                       |
| Origin                        | IGP                                                                                               |
| Next Hop                      | 185.54.80.3                                                                                       |
| AS Path                       | <a href="#">16509</a> (AMAZON-02 - Amazon.com)                                                    |
| MED (Multi-Exit Discrimina... | 1000                                                                                              |
| Local Pref.                   | 305                                                                                               |
| Communities                   | 20203:2003                                                                                        |

# BGP Looking Glass with RPKI

The screenshot displays the ntop BGP Looking Glass interface. At the top, network statistics are shown: IPFIX/sFlow (ZMQ), upload/download speeds (254.40 Mbps / 104.90 Mbps), and various counters (461, 1.3K, 12.8K, 295, 16.2K). The main header indicates 'BGP Looking Glass' with a home icon. A search bar contains '1.1.1.1', and a dropdown shows '1.1.1.0/24' with an 'RPKI: Valid' status. Below the search bar, a table lists BGP peers for the specified IP.

| BGP Peer Id                                          | BGP Peer ASN                | Origin | AS Path                                 | Next Hop      | Local Pref. | MED | Commun                     |
|------------------------------------------------------|-----------------------------|--------|-----------------------------------------|---------------|-------------|-----|----------------------------|
| 193.221.216.30                                       | 5398 (INTERNETONE - Inte... | IGP    | • 5398 (INTERNETC<br>• 13335 (CLOUDFLA  | 77.220.74.109 | 200         |     | • 5398                     |
| 185.54.80.4 (MIX-IT - Default)                       | 202032 (GOLINE - GOLINE ... | IGP    | • 13335 (CLOUDFLA                       | 185.54.80.4   | 305         |     | • 2020                     |
| 38.28.1.11                                           | 174 (COGENT-174 - Cogent... | IGP    | • 174 (COGENT-174<br>• 13335 (CLOUDFLA  | 149.11.89.168 | 200         |     | • 174:2<br>• 174:2         |
| 185.54.80.5 (MINAP - Default)                        | 202032 (GOLINE - GOLINE ... | IGP    | • 13335 (CLOUDFLA                       | 185.54.80.5   | 305         |     | • 2020                     |
| 185.54.80.3 (SWISS-IX - Default) <span>Best 🏆</span> | 202032 (GOLINE - GOLINE ... | IGP    | • 13335 (CLOUDFLA                       | 185.54.80.3   | 305         |     | • 2020                     |
| 212.74.82.15                                         | 8220 (COLT - COLT Techno... | IGP    | • 8220 (COLT - COL<br>• 13335 (CLOUDFLA | 87.241.16.133 | 200         |     | • 8220<br>• 8220<br>• 8220 |

# Traffic vs Exporters vs Interfaces



# What We Have Implemented So Far

- Passive BGP/BMP session analysis.
- AS path visualization is live/historical flows.
- Transit vs. peering traffic breakdown.
- Network prefix change alerts.
- Infrastructure (SNMP) and traffic (NetFlow) correlation.
- Traffic classification (light DPI).
- 100 Gbit+ scalability and distributed network analysis.

BGP Client Info

|                             |                                                         |
|-----------------------------|---------------------------------------------------------|
| Prefix                      | 3.166.80.0/21 <a href="#">🔗</a>                         |
| BGP Peer Id                 | <a href="#">185.40.212.1</a>                            |
| BGP Peer ASN                | <a href="#">62275 (NHM - NHM - S.R.L.)</a>              |
| Origin                      | IGP                                                     |
| Next Hop                    | 10.80.6.1                                               |
| AS Path                     | <a href="#">16509 (AMAZON-02)</a>                       |
| MED (Multi-Exit Discrimi... | 0                                                       |
| Local Pref.                 | 250                                                     |
| Communities                 | 62275:5003<br>62275:33000<br>62275:33001<br>62275:33008 |

# Open Issues (a.k.a. Next Challenges)

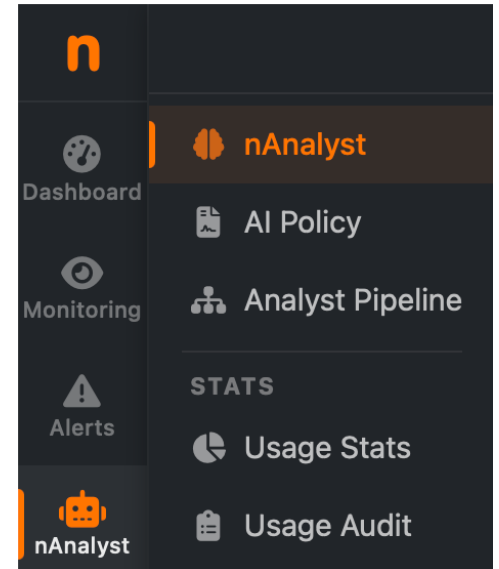
- Gigabytes of metrics to analyze every day.
- Difficulty setting alarm thresholds with dynamic traffic.
- "Poorly correlated" data sources: BGP vs. Flows.
- Little time for operators to allocate to analyzing telemetry data.
- Bottom line:
  - **What's the point of network analysis if we don't have the time to look at it and use it?**

# AI in Network Traffic Analysis

- AI can be a solution for semi-automatically analyzing (advanced triage) data that requires time and expertise.
- A methodology for generating simple answers to complex questions using multiple data sources (traffic, BGP, SNMP).
- Automated root cause hypothesis to reduce incident analysis time.

# AI in ntopng

- ntopng acts as a *telemetry engine* and data source for network analysis.
- The API returns *structured*, AI-friendly JSON.
- Live and historical telemetry data is inserted into the LLM prompts.
- The agent orchestrates the analysis using data provided by the analytics platform.



# AI Tools Catalog

## Tools Catalog



Every agent tool ntopng ships. Tools flagged Locked need a higher license than the one running here.

10



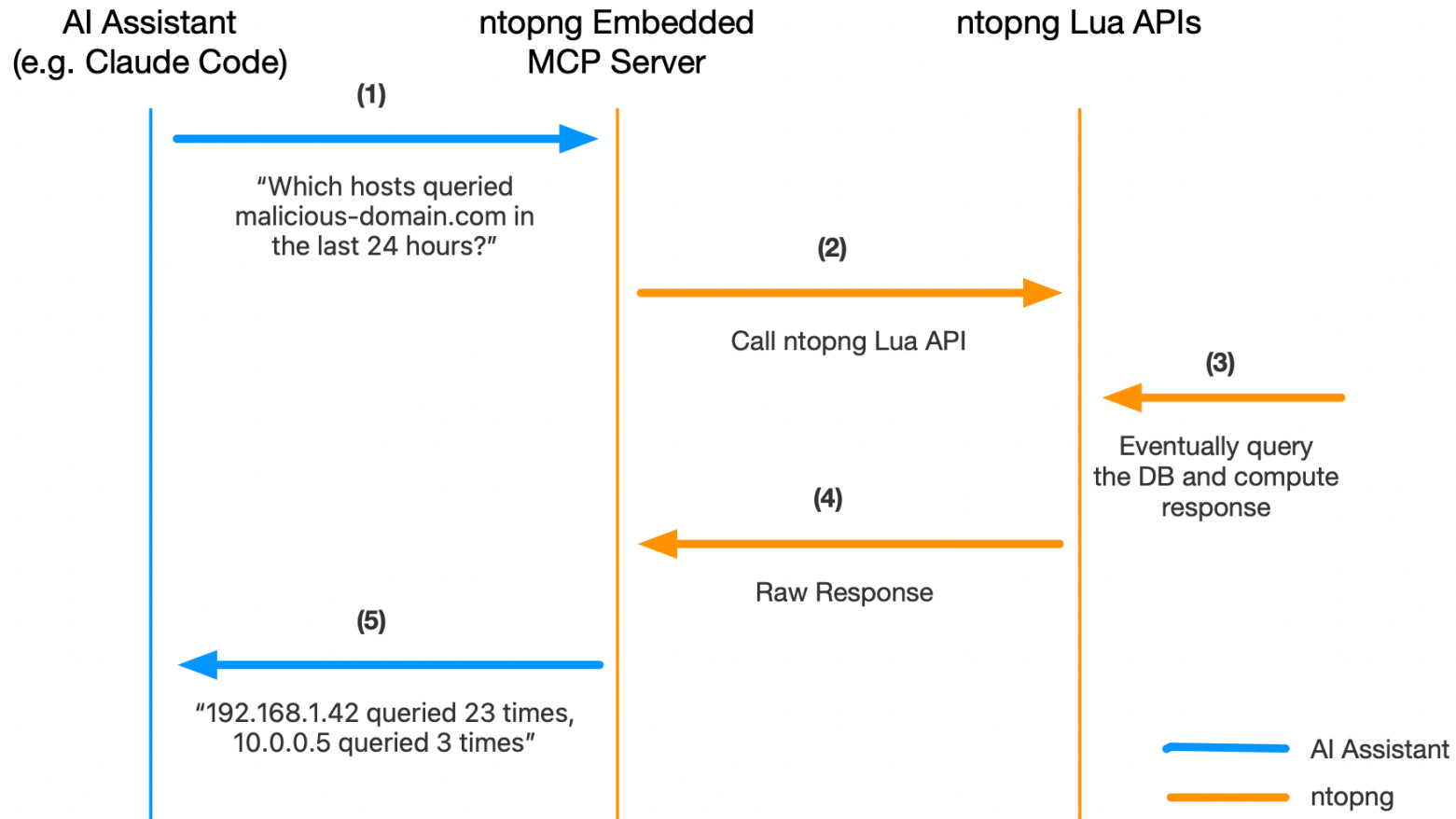
Search:

| Tool                       | Description                                                   | License   | Availability | Annotations |
|----------------------------|---------------------------------------------------------------|-----------|--------------|-------------|
| List Expected Servers      | Return the IP addresses of all EXPECTED/APPROVED n...         | Community | ✓ Available  | Read-only   |
| List Enabled Active M...   | Retrieve all currently enabled active monitoring scripts....  | Community | ✓ Available  | Read-only   |
| List Active Monitoring ... | Retrieve all available active monitoring script definition... | Community | ✓ Available  | Read-only   |
| Get MAC Address Info       | Return details for a given MAC address: manufacturer, ...     | Community | ✓ Available  | Read-only   |
| Get Live Flows Summ...     | Return an aggregated summary of active flows on the ...       | Community | ✓ Available  | Read-only   |
| Get Live Flows For Host    | Return active (live) flows involving a specific IP address... | Community | ✓ Available  | Read-only   |
| Get Interface Address...   | Return the IP addresses assigned to the currently moni...     | Community | ✓ Available  | Read-only   |
| Get Country Stats          | Return top-N countries ranked by traffic seen on the c...     | Community | ✓ Available  | Read-only   |
| Discover LAN               | Return a table of all devices currently visible on the loc... | Community | ✓ Available  | Read-only   |
| Add Active Monitoring...   | Enable a new active monitoring script for a host. IMPO...     | Community | ✓ Available  | Write       |

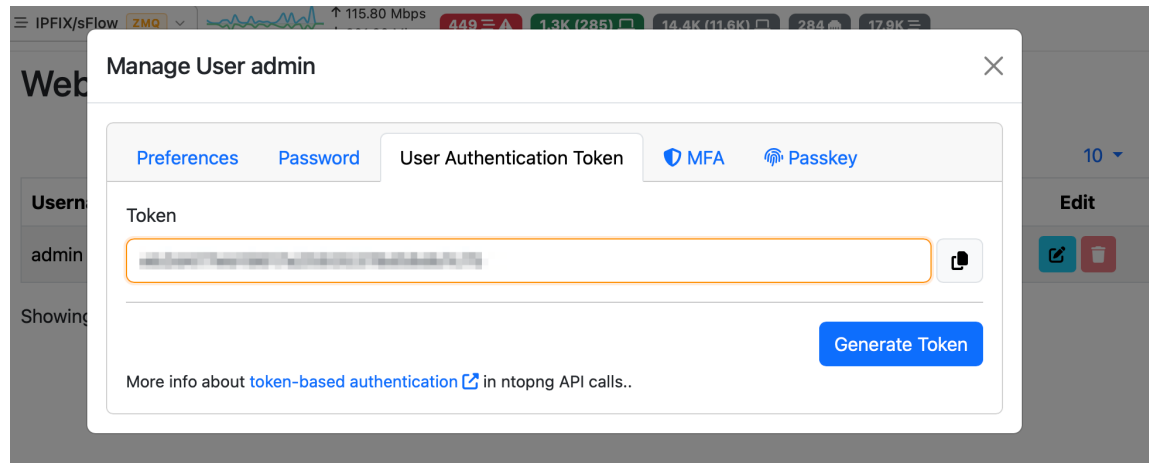
Showing page 1 of 6: total 52 rows

< 1 2 3 4 5 6 > »

# Use Case I: AI Assistant [1/4]



# Use Case I: AI Assistant [2/4]



```
claude mcp add-json myntop '{"type":"http","url":"https://  
ntopng.xxxx.ch/lua/rest/v2/exec/llm/mcp.lua","headers":  
{"Authorization":"Token XXXXXXXXX"}}' --scope user
```

# Use Case I: AI Assistant [4/4]



**Claude Code** v2.1.191  
Sonnet 4.6 · Claude Pro  
/Volumes/T7/deri/network/ntopng

---

## Manage MCP servers

4 servers

**User MCPs** (/Users/deri/.claude.json)

> **goline** · ✓ connected · 33 tools  
**ntopng** · ○ disabled

**claude.ai**

→ Show unused connectors (1)

**Built-in MCPs** (always available)

**computer-use** · ✓ connected · 24 tools

<https://code.claude.com/docs/en/mcp> for help

↑/↓ to navigate · Enter to confirm · Esc to cancel

# Use Case I: AI Assistant [4/4]

What are the top hosts that triggered alerts on transit interfaces?

1 new message

Here are the top hosts that triggered alerts on transit interfaces (last 24 hours, `INTERFACE_ROLE = 1`):

| #  | Host | IP | Alerts | Total Score | Attacker Alerts | Main Alert Type             |
|----|------|----|--------|-------------|-----------------|-----------------------------|
| 1  |      |    | 6,505  | 65,590      | 5               | Remote Access               |
| 2  |      |    | 3,092  | 309,200     | 3,092           | Unexpected NTP server found |
| 3  |      |    | 2,848  | 284,710     | 2,847           | Unexpected NTP server found |
| 4  |      | -  | 1,352  | 13,520      | 0               | Remote Access               |
| 5  |      | -  | 1,091  | 10,910      | 0               | Remote Access               |
| 6  |      | -  | 864    | 8,640       | 0               | Remote Access               |
| 7  |      | -  | 718    | 7,270       | 0               | Remote Access               |
| 8  |      | -  | 641    | 6,500       | 0               | Remote Access               |
| 9  |      | -  | 520    | 5,290       | 0               | Remote Access               |
| 10 |      | -  | 356    | 3,560       | 0               |                             |

1 new message (ctrl+End) ↓

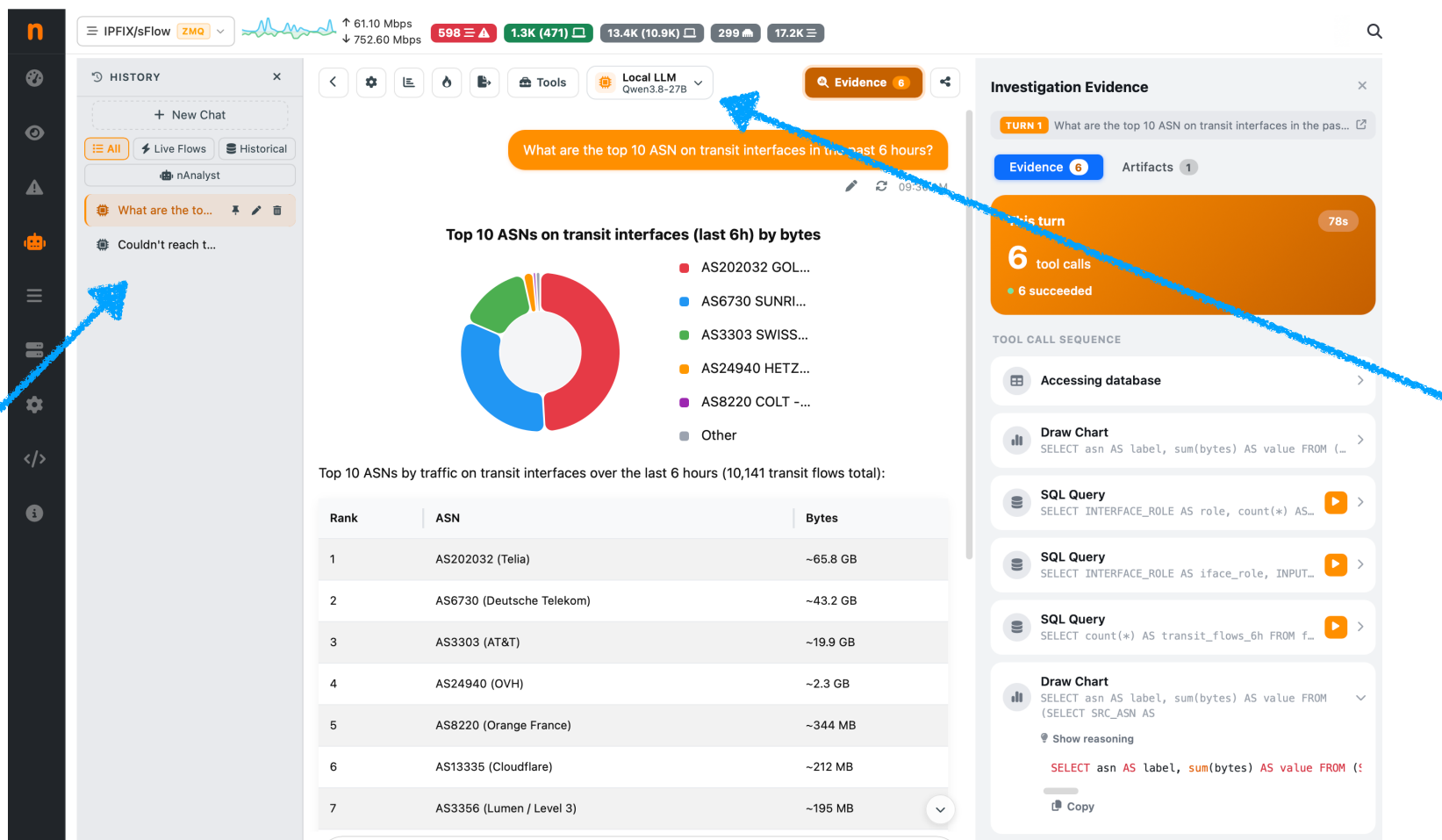
Why are lg.goline.ch and time.goline.ch flagged as attackers for NTP?

? for shortcuts · ← for agents

# Use Case II: nAnalyst [1/4]

Query  
History

ntop



Local  
LLM  
Model

# Use Case II: nAnalyst [2/4]

|    |                           |          |
|----|---------------------------|----------|
| 1  | AS202032 (Telia)          | ~65.8 GB |
| 2  | AS6730 (Deutsche Telekom) | ~43.2 GB |
| 3  | AS3303 (AT&T)             | ~19.9 GB |
| 4  | AS24940 (OVH)             | ~2.3 GB  |
| 5  | AS8220 (Orange France)    | ~344 MB  |
| 6  | AS13335 (Cloudflare)      | ~212 MB  |
| 7  | AS3356 (Lumen / Level 3)  | ~195 MB  |
| 8  | AS62041 (Cogent)          | ~149 MB  |
| 9  | AS12876                   | ~122 MB  |
| 10 | AS33915 (Cogent)          | ~117 MB  |

Two observations worth noting:

- Heavy concentration** — AS202032 (Telia) and AS6730 (Deutsche Telekom) together account for roughly 109 GB, i.e. the large majority of transit traffic. The rest is a long tail under 2.5 GB each.
- Role source** — on this instance `INTERFACE_ROLE` is unset (0) for all flows, so transit was identified via `INPUT_INTERFACE_ROLE = 1` or `OUTPUT_INTERFACE_ROLE = 1`. If you configured a specific interface as transit in the interface settings, confirm it is showing the correct role, otherwise the "transit" filter here may be broader than intended.

The pie chart above shows the same distribution visually.

📄 🔄 🔍 6 tool calls → 09:32 AM · 78s · 34.8 tok/s

Ask a question

⚠️ nAnalyst can make mistakes. Always verify critical information independently

**Investigation Evidence**

**TURN 1** What are the top 10 ASN on transit interfaces in the pas...

**Evidence 6** Artifacts 1

**This turn** 78s  
6 tool calls  
6 succeeded

**TOOL CALL SEQUENCE**

- Accessing database
- Draw Chart  
SELECT asn AS label, sum(bytes) AS value FROM (SELECT SRC\_ASN AS

**Hide reasoning**

The flows table has `INTERFACE_ROLE` (1=transit) and `SRC_ASN/DST_ASN`. The user wants top 10 ASNs on transit interfaces in past 6 hours. On transit interfaces, the remote peer ASNs are the meaningful ones. I'll aggregate by both source and destination ASN combined (all ASNs seen on transit interfaces) by total bytes. I'll use a pie chart with `label_type=asn`. Past 6 hours: `FIRST_SEEN >= now() - 21600`. I'll union `SRC_ASN` and `DST_ASN` to capture all ASNs seen on transit interfaces, grouping by ASN. Let me build a query that takes both directions. I'll use a `UNION ALL` of `src` and `dst` ASNs, filter `INTERFACE_ROLE=1`, exclude ASN 0/unknown, group by ASN, sum bytes, order desc limit 10. The chart tool resolves ASN labels via `label_type=asn` when `label` is `SRC_ASN` or `DST_ASN`. But here I'm aliasing a combined column. Let me alias it as `asn` so the query tool resolves — but chart uses `label` column. To be safe I'll alias the ASN column as `'asn'` and set `label_type=asn`. Actually chart resolves based on `label_type` regardless of alias name. I'll alias `AS label` and value, `label_type=asn`.

```
SELECT asn AS label, sum(bytes) AS value FROM
```

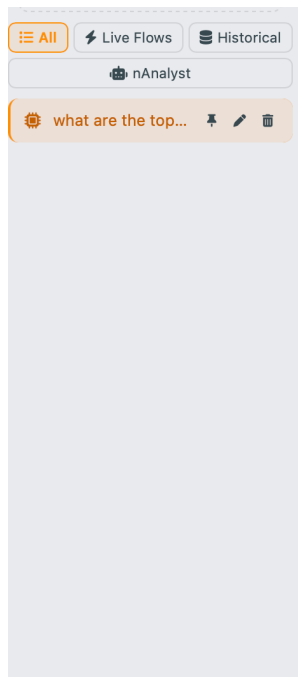
**Conv**

Mapping reasoning to actions

Internal Reasoning

Query SQL

# Use Case II: nAnalyst [3/4]



06:31 PM · 81s · 59.7 tok/s

Ποια είναι τα 10 κορυφαία ASN σε διεπαφές μέσω μαζικής μεταφοράς την τελευταία ώρα  
06:32 PM

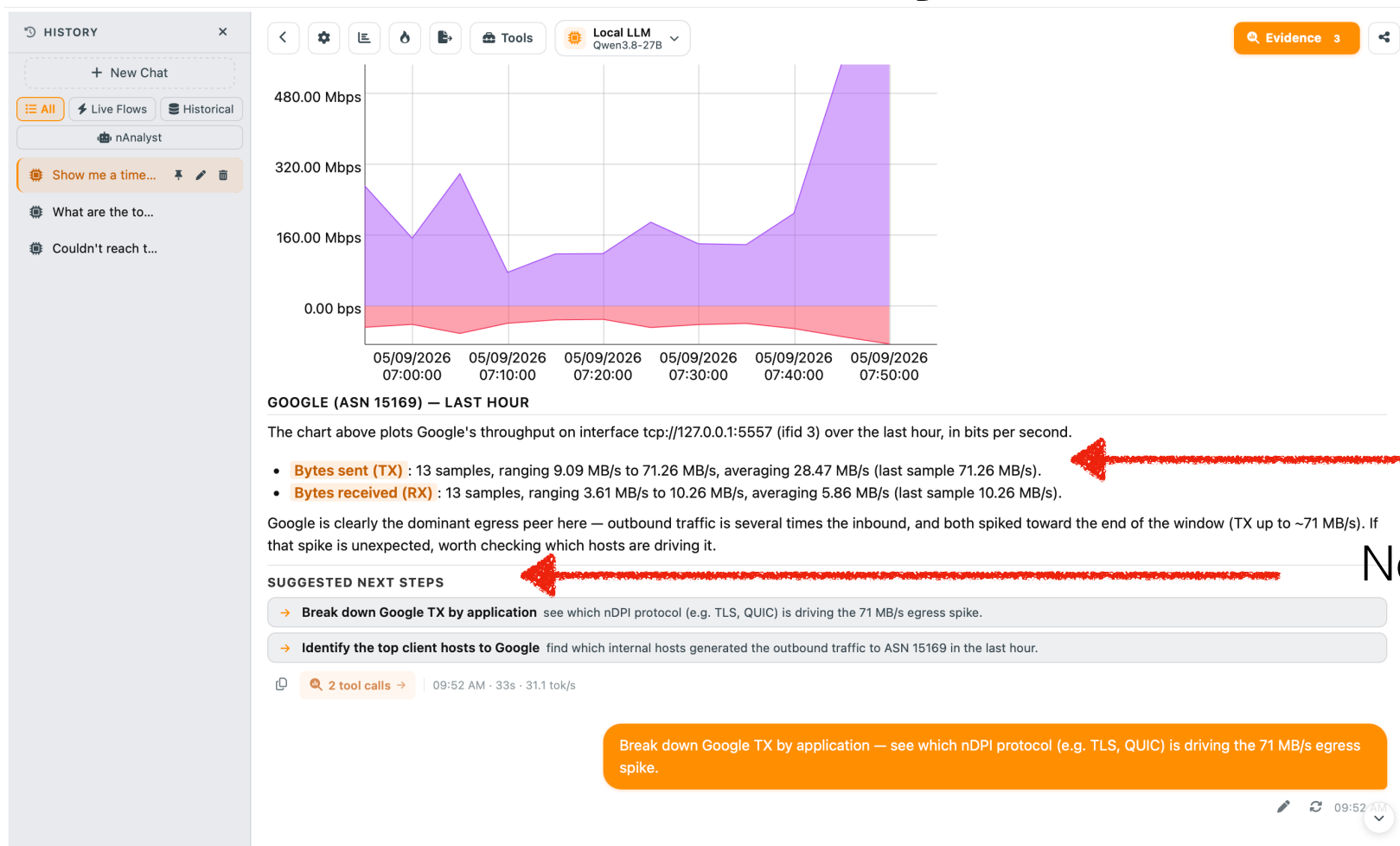


## Τα 10 Κορυφαία ASN την Τελευταία Ώρα

| Rank | ASN    | Organization                           | Total Traffic |
|------|--------|----------------------------------------|---------------|
| 1    |        |                                        | 201.88 GB     |
| 2    |        |                                        | 51.08 GB      |
| 3    |        |                                        | 34.44 GB      |
| 4    | 13335  | Cloudflare, Inc.                       | 28.80 GB      |
| 5    | 396982 | Google LLC                             | 9.98 GB       |
| 6    | -      | No ASN                                 | 8.88 GB       |
| 7    | 36183  | Akamai Technologies, Inc.              | 6.97 GB       |
| 8    | 8220   | COLT Technology Services Group Limited | 6.22 GB       |
| 9    | 174    | Cogent Communications, LLC             | 6.13 GB       |
| 10   | 15796  | Salt Mobile SA                         | 5.45 GB       |

Multi-language  
Support

# Use Case II: nAnalyst [4/4]



Expert Analysis

Next Steps

Context

# Use Case III: Playbooks [1/4]

A playbook allows you to specify actions in natural language, that you want to repeat periodically.

IPFIX/sFlow

ZMQ

↑ 4.50 Gbps  
↓ 2.00 Gbps

402

1.3K (218)

13.9K (11.6K)

289

17.9K

Generate Playbook from Natural Language

DESCRIBE YOUR INVESTIGATION

Investigate DNS exfiltration from internal hosts

Track lateral movement: hosts scanning many destinations

VPN user traffic analysis and destinations visited

Identify top bandwidth consumers in the last 24h

Alert me if TLS traffic on transit interfaces exceed peering interfaces. If so tell me which ASN are responsible for the problem

to generate

LLM PROVIDERS

Local LLM  
Qwen3.6-27B

Generate

Playbooks

Executor

10

Search:

| Actions | Name | Description | Provider | Date |
|---------|------|-------------|----------|------|
|---------|------|-------------|----------|------|

# Use Case III: Playbooks [2/4]

IPFIX/sFlow

ZMQ

↑ 422.70 Mbps  
↓ 165.90 Mbps

335

1.3K (226)

13.8K (11.5K)

294

17.9K

Generate Playbook from Natural Language

← New

**Playbook Generated** 21.5s

Review the stages and params before saving

| NAME                                  | DESCRIPTION                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------------------|
| TLS Transit vs Peering ASN Drill-Down | Identifies if TLS traffic on transit interfaces exceeds peering interfaces and lists responsible ASNs. |

This playbook analyzes TLS (L7\_PROTO=91) traffic volumes, comparing transit interfaces against peering interfaces. If the transit volume exceeds peering, it drills down into the Autonomous System Numbers (ASNs) contributing most to the transit traffic to identify the source of the imbalance.

STAGES

1

s1

Interface Volume Comparison

1/3

Compares total TLS bytes between Transit (Role 1) and Peering (Role 2) interfaces.

```
SELECT
  flows.INTERFACE_ID AS interface_id,
  flows.INTERFACE_ROLE AS role_id,
  CASE flows.INTERFACE_ROLE
    WHEN 1 THEN 'Transit'
    WHEN 2 THEN 'Peering'
    ELSE 'Other'
  END AS interface_type,
  count() AS num_flows,
  formatReadableSize(sum(flows.TOTAL_BYTES)) AS total_bytes
FROM flows
WHERE flows.INTERFACE_ID = {{ifid}}
  AND flows.FIRST_SEEN >= toDateTime('{{epoch_start}}')
  AND flows.FIRST_SEEN <= toDateTime('{{epoch_end}}')
  AND flows.L7_PROTO = 91
GROUP BY flows.INTERFACE_ID, flows.INTERFACE_ROLE
ORDER BY sum(flows.TOTAL_BYTES) DESC
LIMIT 100
```

OUTPUT COLUMNS:

interface\_id number

role\_id number

interface\_type string

num\_flows number

total\_bytes bytes

# Use Case III: Playbooks [3/4]



IPFIX/sFlow ZMQ



↑ 319.10 Mbps  
↓ 1.40 Gbps

647 

1.3K (226) 

14.1K (11.3K) 

293 

17.5K 



Playbooks

Executor

 This playbook analyzes TLS (L7\_PROTO=91) traffic volumes, comparing transit interfaces against peering interfaces. If the transit volume exceeds peering, it drills down into the Autonomous System Numbers (ASNs) contributing most to the transit traffic to identify the source of the imbalance.

Last 30 Mins 

25/06/2026 16:37 → 25/06/2026 17:07

Apply 

VOLUME THRESHOLD (BYTES)  
10737418 

Run Playbook

Delete

Stages

 Interface Volume Comparison  
s1 5

 Top Transit Source ASNs  
s2 100

 Top Transit Destination ASNs  
s3 96

Interface Volume Comparison 5 rows

| INTERFACE ID | ROLE ID | INTERFACE TYPE | FLOW COUNT | TOTAL BYTES |
|--------------|---------|----------------|------------|-------------|
| 3            | 4       | Other          | 304332     | 3.65 TiB    |
| 3            | 2       | Peering        | 126175     | 1.27 TiB    |
| 3            | 6       | Other          | 20651      | 167.84 GiB  |
| 3            | 1       | Transit        | 16914      | 41.98 GiB   |
| 3            | 0       | Other          | 1880       | 4.33 GiB    |

# Use Case III: Playbooks [4/4]

The screenshot displays the ntopng Playbooks interface. At the top, a status bar shows network metrics: IPFIX/sFlow (ZMQ), traffic volume (18.80 Gbps up, 3.50 Gbps down), and various counters (355, 1.3K (218), 14.1K (11.8K), 295, 19.6K). A search icon is on the right.

The main section is titled "Playbooks" with an "Executor" button. A description states: "This playbook analyzes TLS (L7\_PROTO=91) traffic volumes, comparing transit interfaces against peering interfaces. If the transit volume exceeds peering, it drills down into the Autonomous System Numbers (ASNs) contributing most to the transit traffic to identify the source of the imbalance."

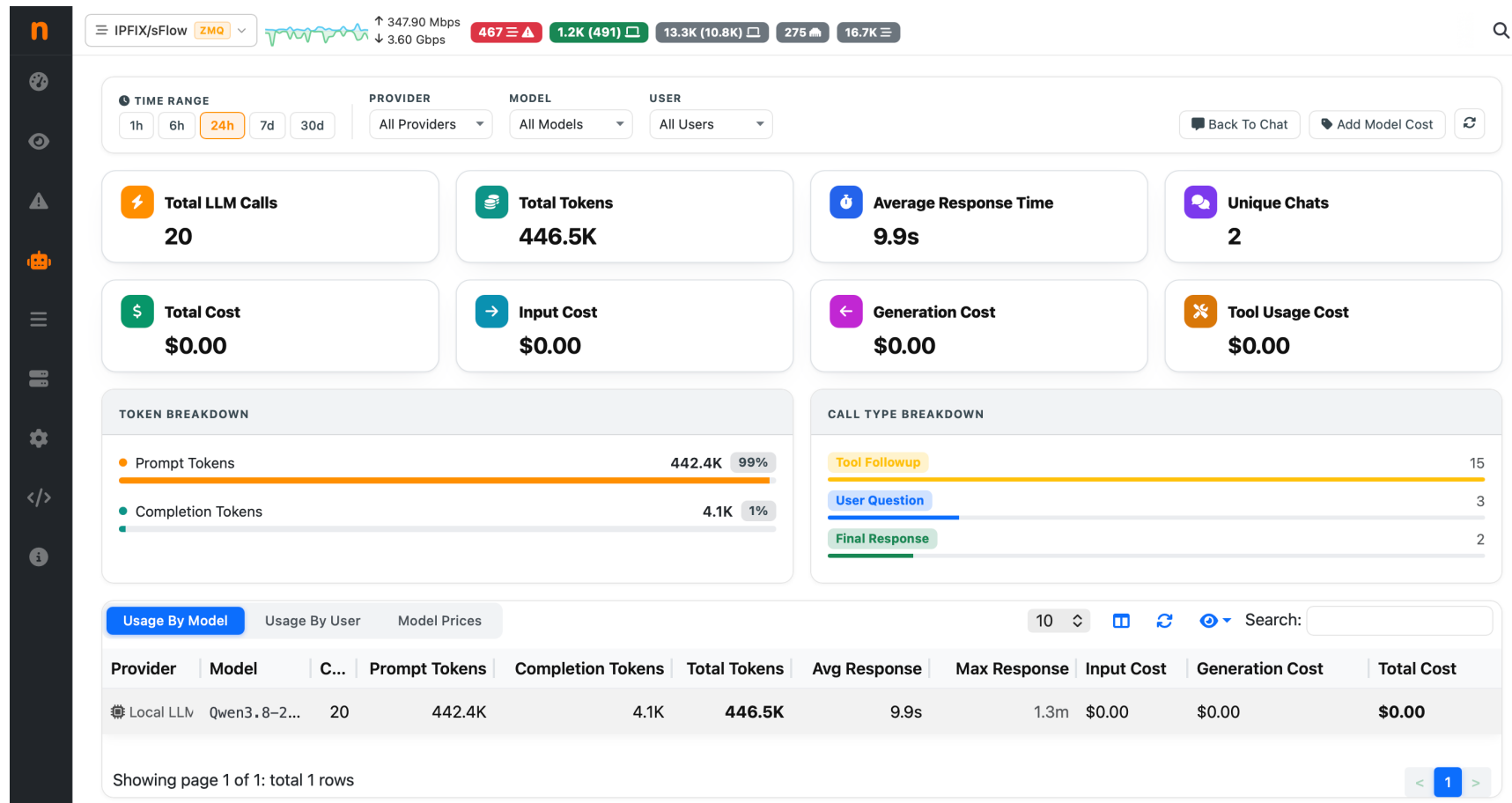
Below the description, there are filters for "Last 30 Mins", a date range from "25/06/2026 16:37" to "25/06/2026 17:07", an "Apply" button, a "VOLUME THRESHOLD (BYTES)" set to "10737418", and a "Run Playbook" button. A "Delete" button is also present.

The "Stages" section on the left, highlighted with a red box, lists three stages: "Interface Volume Comparison" (s1, 5), "Top Transit Source ASNs" (s2, 100), and "Top Transit Destination ASNs" (s3, 96). The third stage is currently selected.

The main table, titled "Top Transit Destination ASNs" (96 rows), displays the following data:

| DESTINATION ASN | FLOW COUNT | TOTAL BYTES |
|-----------------|------------|-------------|
| 202032          | 4454       | 14.14 GiB   |
| 24940           | 11207      | 11.70 GiB   |
| 6730            | 370        | 8.43 GiB    |
| 9002            | 34         | 4.32 GiB    |
| 19679           | 8          | 1.24 GiB    |
| 20940           | 24         | 550.03 MiB  |
| 3303            | 64         | 330.02 MiB  |
| 6185            | 14         | 243.00 MiB  |
| 15169           | 24         | 146.10 MiB  |
| 29802           | 179        | 123.35 MiB  |
| 396986          | 9          | 92.66 MiB   |
| 32475           | 8          | 83.41 MiB   |
| 15924           | 12         | 72.34 MiB   |

# Keep an Eye on Your Tokens



# Conclusions

- Telemetry alone is **necessary** but not sufficient.
- Reasoning for the collected data is the true value of network traffic monitoring: graphs alone are a curiosity.
- ntopng implements the "building blocks" for analyzing data with AI.
- The system allows us to create repetitive pipelines in which we summarize our experience, which the AI executes and interprets, providing us with evidence of what we've done and executing actions based on the results obtained.
- The future will be a **collaboration** between human experts and AI-NetOps.

PS: We're looking for users who want to use the tool and help us improve it by providing feedback and suggestions, as well spread the word. If you're a developer, you can also write extensions. Interested?



<https://github.com/ntop/nProbe/tree/master/bgp>

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