ntop 2Q23 Webinar

Highlights

Title	Speaker
Introduction, OT Monitoring, Aggregated Flows, Zoom/Teams Monitoring, OpenAPI	Luca Deri
SNMP Devices/Host Traffic Rules, Server Port Analysis	Nicolò Maio
Live vs Inactive Monitoring, New GUI: Tables and Charts	Matteo Biscosi
Smart Recording, Suricata/Zeek at 100Gbit, New Licensing Model	Alfredo Cardigliano
Open Discussion	

Call for Paper Deadline JUNE 30TH, 2023

SEPTEMBER 21 (TRAINING)-22 (CONFERENCE), 2023

https://www.ntop.org/ntopconf2023/

25 th ANNIVERSARY

SCADA/OT Monitoring

Introduction

- ntopng/nProbe have been used in SCADA/OT monitoring for a while.
  - November 2020: Added support IEC 60870-5-104
  - ntopConf 2022: M. Scheu shown how to use ntop tools for monitoring critical infrastructures.

  - Leading OT monitoring companies use ntop tools inside their products.

Ntop and OT/Scada [1/2]

- Ntop tools are not “vertical” tools OT-only but are designed to solving “generic monitoring” problems including:
  - Active/Passive Asset Discovery and Management.
  - Traffic Monitoring.
  - Behavioural Traffic Analysis.
  - Anomaly and vulnerability detection.
  - Threat Intelligence

Ntop and OT/Scada [2/2]

- OT/Scada is supported “à la ntop way” namely”
  - Add support in nDPI

```
 44 Modbus              TCP       X       Acceptable   IoT-Scada
244 DNP3                TCP       X       Acceptable   IoT-Scada
245 IEC60870            TCP       X       Acceptable   IoT-Scada
331 TuyaLP              UDP       X       Acceptable   IoT-Scada
332 TPLINK_SHP          TCP/UDP   X       Acceptable   IoT-Scada
334 BACnet              UDP       X       Safe         IoT-Scada
```

  - Implement nProbe Plugin (below ModbusTCP)

```
#
# Timestamp[epoch]      SrcIP[ascii:32] DstIP[ascii:32] SrcMAC[ascii:17]       DstMAC[ascii:17]       SrcPort[uint]   DstPort[uint]  Protocol[ascii:16]
      TransactionId[uint]     ProtocolId[uint]        Length[uint]    Unit[uint]      Function[uint]  ReferenceNum[uint]      Data[hex:4]     Padding[hex:2]
#
1686993895      192.168.3.201   192.168.3.30    18:60:24:97:CE:06       00:D0:C9:EF:D7:C5       54047   502     Modbus/TCP      4313    16      0001    00
1686993895      192.168.3.201   192.168.3.30    18:60:24:97:CE:06       00:D0:C9:EF:D7:C5       54047   502     Modbus/TCP      4314    20      0001    00
1686993895      192.168.3.201   192.168.3.30    18:60:24:97:CE:06       00:D0:C9:EF:D7:C5       54047   502     Modbus/TCP      4315    0001    00
1686993895      192.168.3.201   192.168.3.30    18:60:24:97:CE:06       00:D0:C9:EF:D7:C5       54047   502     Modbus/TCP      4316    18      0001    00
1686993895      192.168.1.201   192.168.1.137   18:60:24:97:CE:06       00:1F:08:02:47:AE       54275   502     Modbus/TCP      556     1039    0010    00
```

  - Extend ntopng

ntopng and OT/Scada

- ntopng is able detect, report and alert
  - Unusual error messages
  - Unsupported function calls
  - Function calls that have not been used before
  - Unknown function codes
  - Abnormal protocol behaviour
  - Unexpected state transition
  - Values outside of defined ranges
  - Changes in frequency / periodicity

OT/Scada Behavioural Checks

All (162) | Enabled (107) | Disabled (55)

Filter Categories | Search Script: iec

Name	Interface	Category	Severity	Description	Values	Action
IEC Invalid Command Transition			Notice	Trigger an alert when a command to/from command or measure to/from command IEC transition is detected		
IEC Invalid Transition			Notice	Trigger an alert when an invalid IEC transition is detected		
IEC Unexpected TypeID			Notice	Trigger an alert when an unexpected TypeID is detected in IEC 104 protocol	9, 13, 36, 45, 46, 48, 30, 103, ...	

All (162) | Enabled (107) | Disabled (55)

Filter Categories | Search Script: modb

Name	Interface	Category	Severity	Description	Values	Action
ModbusTCP Invalid Transition			Notice	Trigger an alert when an invalid ModbusTCP transition is detected		
ModbusTCP Too Many Exceptions			Error	Trigger an alert when a flow reports a number of exceptions exceeding the specified threshold		
ModbusTCP Unexpected Function Code			Error	Trigger an alert when an unexpected ModbusTCP Function code is detected	3, 6, 16	

Transition/State Monitoring

ModbusTCP

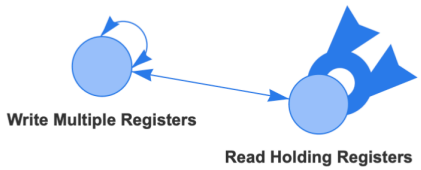
Function Codes

Function	Uses
Read Holding Registers (3)	1,102
Write Multiple Registers (16)	6

Registers

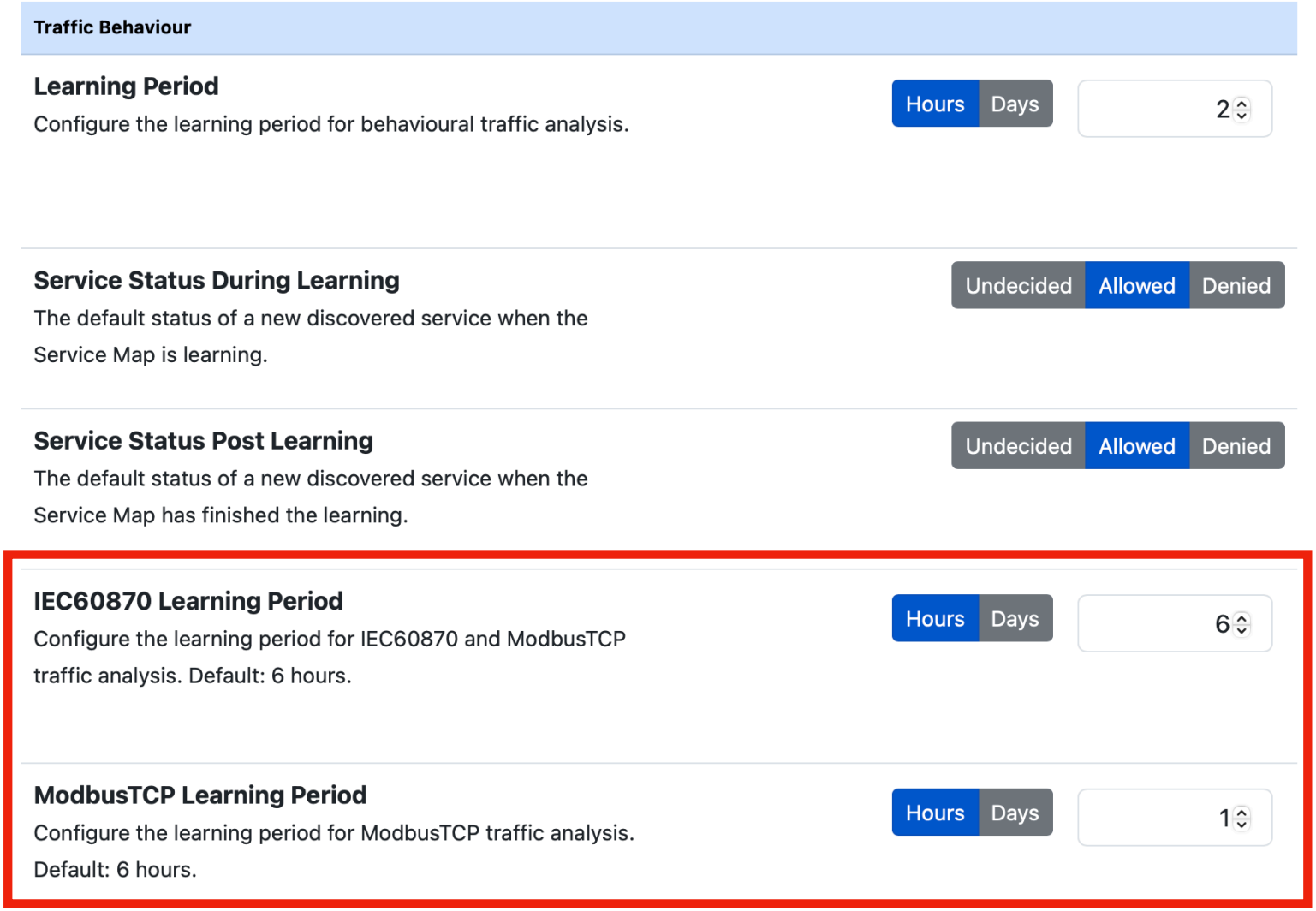
Register	Uses
0	1,105
1	1,089
2	1,089
7	1,089
8	1,089
3	1,089
5	1,089
6	1,089
4	1,089
9	1,089

Function Code Transitions



Exceptions	16

Behavioural Learning



Alerts

Show 10 Entries

Actio...	Date/Time	Score	Application	Alert	Flow	Description
	12:04:21	100	TCP:Modbus DPI	ModbusTCP Invalid Function Code	172.16.203.200:3343 172.16.203.5:502	Function Code 'Write Single Regi...
	12:04:21	200	TCP:Modbus DPI	ModbusTCP Too Many Exceptions	172.16.203.200:3343 172.16.203.5:502	1 Exceptions
	12:04:21	300	TCP:Modbus DPI	ModbusTCP Invalid Function Code	172.16.203.200:3343 172.16.203.5:502	Function Code 'Write Multiple Re...
	12:04:21	100	TCP:Modbus DPI	ModbusTCP Too Many Exceptions	172.16.203.200:1788 172.16.203.5:502	1 Exceptions
	12:04:21	100	TCP:Modbus DPI	ModbusTCP Too Many Exceptions	172.16.203.200:2634 172.16.203.5:502	1 Exceptions
	12:04:21	200	TCP:Modbus DPI	ModbusTCP Invalid Function Code	172.16.203.200:2634 172.16.203.5:502	Function Code 'Write Multiple Re...
	12:04:21	100	TCP:Modbus DPI	ModbusTCP Invalid Function Code	192.168.3.201:54047 192.168.3.30:502	Function Code 'Read Coils (1)' de...

Alert: ModbusTCP Invalid Function Code | 172.16.203.200:3343 172.16.203.5:502 | **Overview**

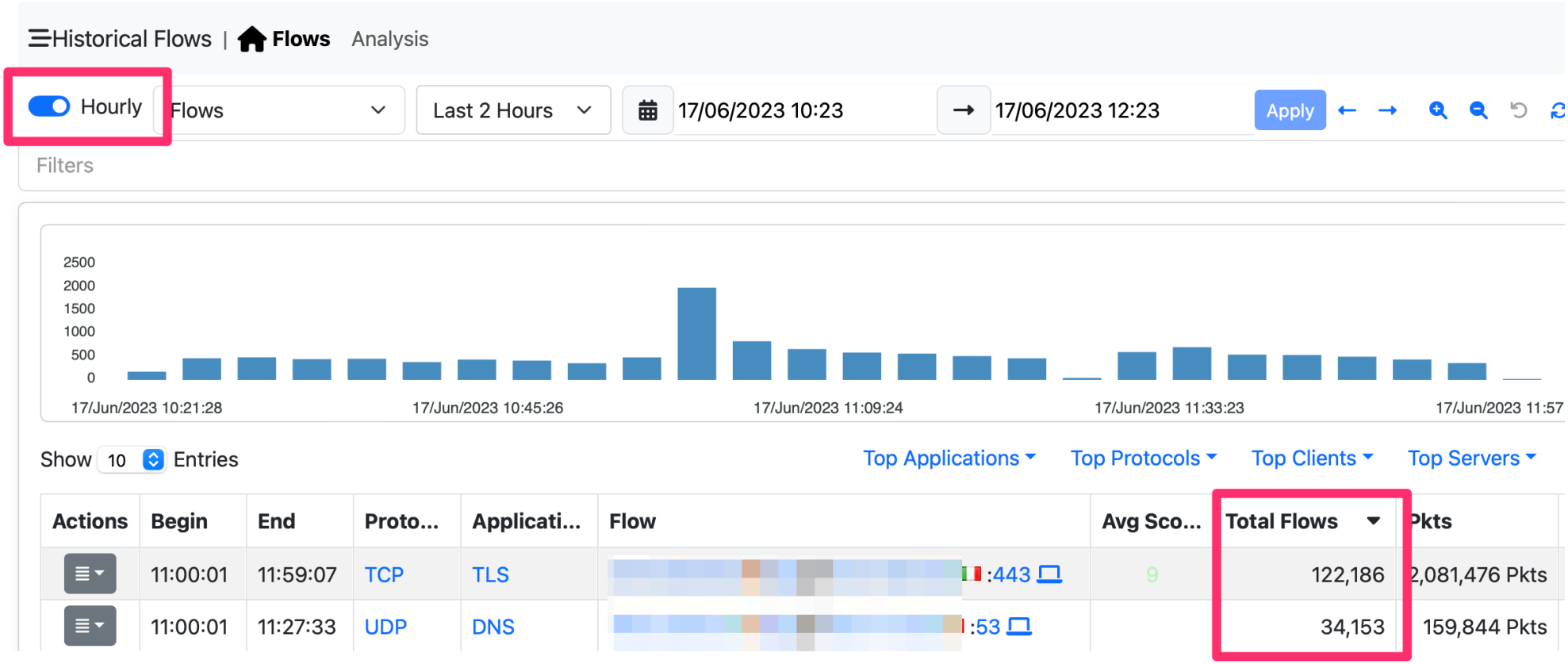
Alert	ModbusTCP Invalid Function Code	
Flow Peers [Client / Server]	172.16.203.200:3343 172.16.203.5:502	
Protocol / Application	TCP:Modbus	
Date/Time	12:05:46	
Score	200	
Description	Function Code 'Write Single Register (6)' detected	
Other Issues	ModbusTCP Too Many Exceptions	
Traffic Info	**Client to Server Traffic**	82.15 KB
	Main Direction	Server → Client
	Server to Client Traffic	139.95 KB

Aggregated Flows

ClickHouse Historical Flows

- ntopng has the ability to:
  - Dump historical flows into ClickHouse.
  - Correlate flows with alerts.
  - Download (n2disk is required) flows with traffic traces.
- Historical flows can be heavy (hundred of million/day) and exhaust disk space.
- What if we can aggregate flows, save disk space, and still have the ability to have accurate “Top X” and alert correlation?

Aggregated Flows [1/2]



Aggregated Flows [2/2]

- Typical savings ratio: 133M vs 648K (1:200)

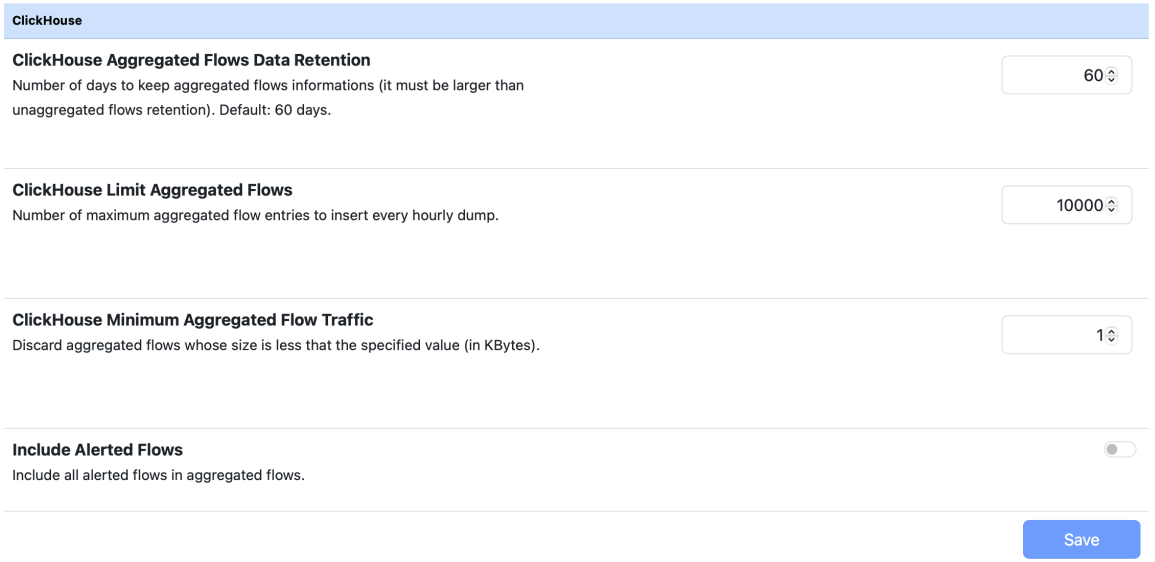
< 1 2 3 4 5 6 > »

Processed 12,934,942 records [133,967,482 records/sec].

< 1 2 3 4 5 6 > »

Processed 13,750 records [648,893 records/sec].

- Flexible Settings



- Next Step: Aggregate Alerts

Zoom and
MS Teams Monitoring

Zoom/MS Teams Monitoring [1/2]

- nDPI has been enhanced…

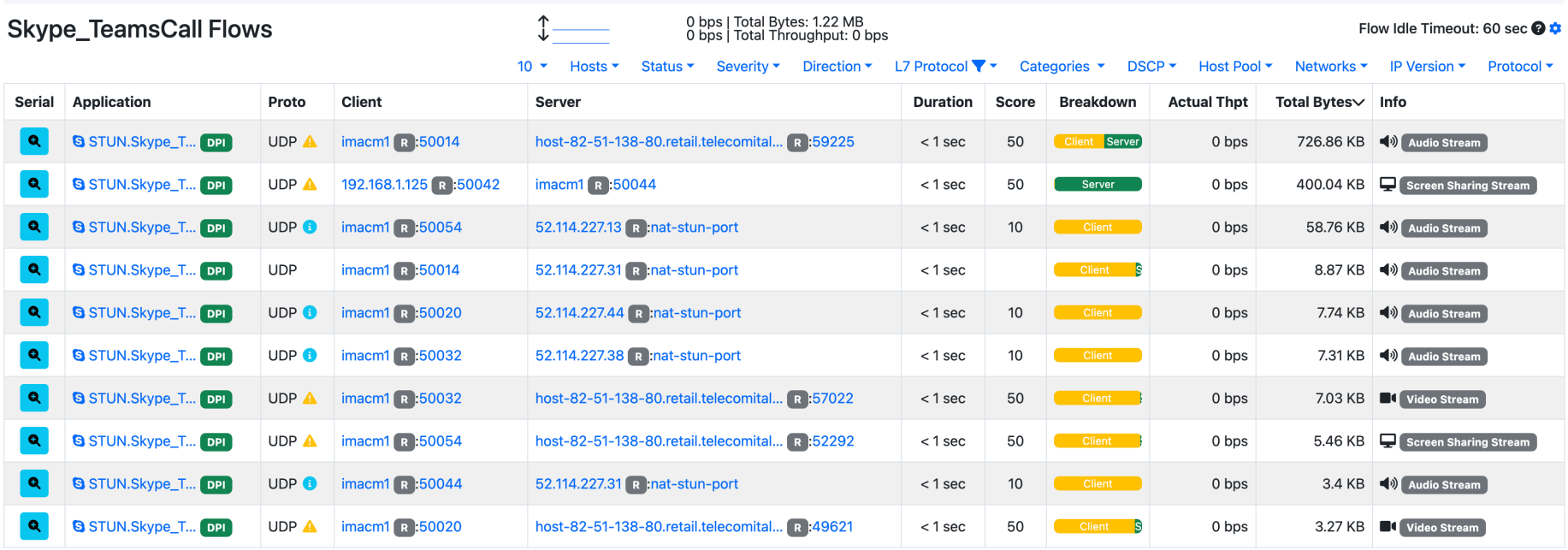
```
 38 Skype_TeamsCall        TCP                 Acceptable   VoIP
125 Skype_Teams            UDP                 Acceptable   VoIP
189 Zoom                   TCP                 Acceptable   Video
250 Teams                  TCP                 Safe         Collaborative
```

- nProbe has been Enhanced to handle STUN/RTP flows with “non-standard”

```
[NFv9 57626][IPFIX 35632.154][Len 4] %RTP_IN_JITTER            RTP jitter (ms * 1000)
[NFv9 57627][IPFIX 35632.155][Len 4] %RTP_OUT_JITTER           RTP jitter (ms * 1000)
[NFv9 57628][IPFIX 35632.156][Len 4] %RTP_IN_PKT_LOST          Packet lost in stream (src->dst)
[NFv9 57629][IPFIX 35632.157][Len 4] %RTP_OUT_PKT_LOST         Packet lost in stream (dst->src)
[NFv9 57902][IPFIX 35632.430][Len 4] %RTP_IN_PKT_DROP          Packet discarded by Jitter Buffer (src->dst)
[NFv9 57903][IPFIX 35632.431][Len 4] %RTP_OUT_PKT_DROP         Packet discarded by Jitter Buffer (dst->src)
[NFv9 57633][IPFIX 35632.161][Len 1] %RTP_IN_PAYLOAD_TYPE      RTP payload type
[NFv9 57630][IPFIX 35632.158][Len 1] %RTP_OUT_PAYLOAD_TYPE     RTP payload type
[NFv9 57631][IPFIX 35632.159][Len 4] %RTP_IN_MAX_DELTA         Max delta (ms*100) between consecutive pkts (src->dst)
[NFv9 57632][IPFIX 35632.160][Len 4] %RTP_OUT_MAX_DELTA        Max delta (ms*100) between consecutive pkts (dst->src)
[NFv9 57820][IPFIX 35632.348][Len 64 varlen] %RTP_SIP_CALL_ID          SIP call-id corresponding to this RTP stream
[NFv9 57906][IPFIX 35632.434][Len 4] %RTP_MOS                  RTP pseudo-MOS (value * 100) (average both directions)
[NFv9 57842][IPFIX 35632.370][Len 4] %RTP_IN_MOS               RTP pseudo-MOS (value * 100) (src->dst)
[NFv9 57904][IPFIX 35632.432][Len 4] %RTP_OUT_MOS              RTP pseudo-MOS (value * 100) (dst->src)
[NFv9 57908][IPFIX 35632.436][Len 4] %RTP_R_FACTOR             RTP pseudo-R_FACTOR (value * 100) (average both directions)
[NFv9 57843][IPFIX 35632.371][Len 4] %RTP_IN_R_FACTOR          RTP pseudo-R_FACTOR (value * 100) (src->dst)
[NFv9 57905][IPFIX 35632.433][Len 4] %RTP_OUT_R_FACTOR         RTP pseudo-R_FACTOR (value * 100) (dst->src)
[NFv9 57853][IPFIX 35632.381][Len 4] %RTP_IN_TRANSIT           RTP Transit (value * 100) (src->dst)
[NFv9 57854][IPFIX 35632.382][Len 4] %RTP_OUT_TRANSIT          RTP Transit (value * 100) (dst->src)
[NFv9 57852][IPFIX 35632.380][Len 4] %RTP_RTT                  RTP Round Trip Time (ms)
```

Zoom/MS Teams Monitoring [2/2]

- And ntopng too…



Skype_TeamsCall Flows

0 bps | Total Bytes: 1.22 MB
0 bps | Total Throughput: 0 bps

Flow Idle Timeout: 60 sec

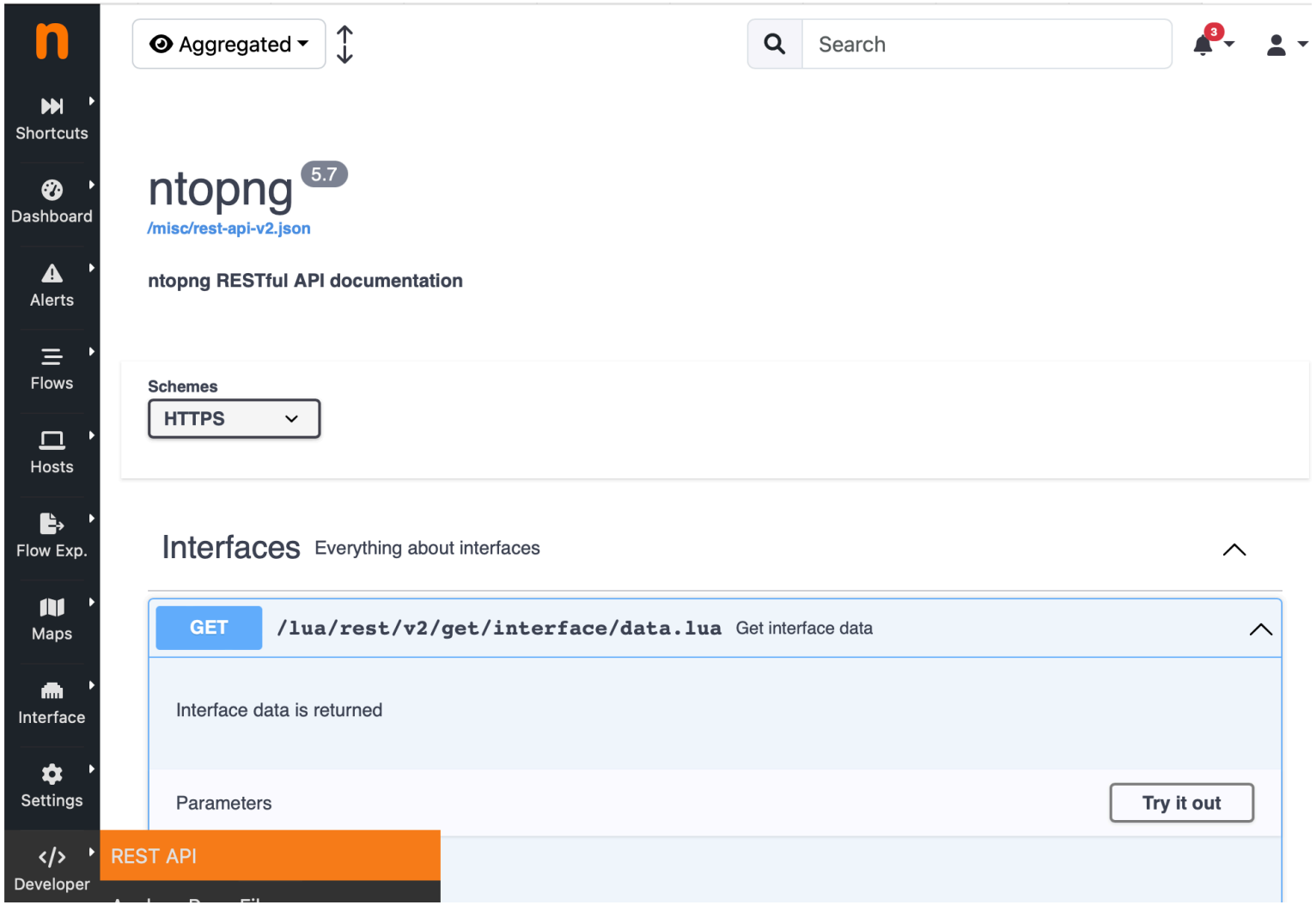
10 ▾ Hosts ▾ Status ▾ Severity ▾ Direction ▾ L7 Protocol ▾ Categories ▾ DSCP ▾ Host Pool ▾ Networks ▾ IP Version ▾ Protocol ▾

Serial	Application	Proto	Client	Server	Duration	Score	Breakdown	Actual Thpt	Total Bytes	Info
	STUN.Skype_T... DPI	UDP	imacm1 R:50014	host-82-51-138-80.retail.telecomital... R:59225	< 1 sec	50	Client Server	0 bps	726.86 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	192.168.1.125 R:50042	imacm1 R:50044	< 1 sec	50	Server	0 bps	400.04 KB	Screen Sharing Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50054	52.114.227.13 R:nat-stun-port	< 1 sec	10	Client	0 bps	58.76 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50014	52.114.227.31 R:nat-stun-port	< 1 sec		Client	0 bps	8.87 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50020	52.114.227.44 R:nat-stun-port	< 1 sec	10	Client	0 bps	7.74 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50032	52.114.227.38 R:nat-stun-port	< 1 sec	10	Client	0 bps	7.31 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50032	host-82-51-138-80.retail.telecomital... R:57022	< 1 sec	50	Client	0 bps	7.03 KB	Video Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50054	host-82-51-138-80.retail.telecomital... R:52292	< 1 sec	50	Client	0 bps	5.46 KB	Screen Sharing Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50044	52.114.227.31 R:nat-stun-port	< 1 sec	10	Client	0 bps	3.4 KB	Audio Stream
	STUN.Skype_T... DPI	UDP	imacm1 R:50020	host-82-51-138-80.retail.telecomital... R:49621	< 1 sec	50	Client	0 bps	3.27 KB	Video Stream

Flow: 192.168.1.29:50014 ⇄ 82.51.138.80:59225 | **Overview**

Flow Peers [Client / Server]	imacm1 R P:50014 [9C:58:3C:A7:EE:CC] ⇄ host-82-51-138-80.retail.telecomitalia.it R:59225 [10:13:31:F1:39:76]
Protocol / Application	UDP / STUN.Skype_TeamsCall (VoIP) [Confidence: DPI] [Audio Stream]

Finally… OpenAPI



Presentation Outline

- SNMP Devices Rules
- Host/Network Interface Rules
- Server Ports Analysis Page

PS: All the features displayed on this presentation are available only from Enterprise L license or superior.

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SNMP Devices Rules [1/3]

- Monitoring several SNMP devices in order to unveil changes and changed trends in traffic, can be difficult.
- SNMP Devices Rules enables the creation of periodic checks (for all or a selected SNMP device) at a specific frequency (5 mins, 1 hour, or 1 day).
- The triggered rules will emit a “Threshold Crossed” alert when a SNMP Device exceeds (up or down) the specified threshold (Packets, Bytes or Interface Errors).
- Available only from Enterprise L license or superior.

SNMP Devices Rules [2/3]

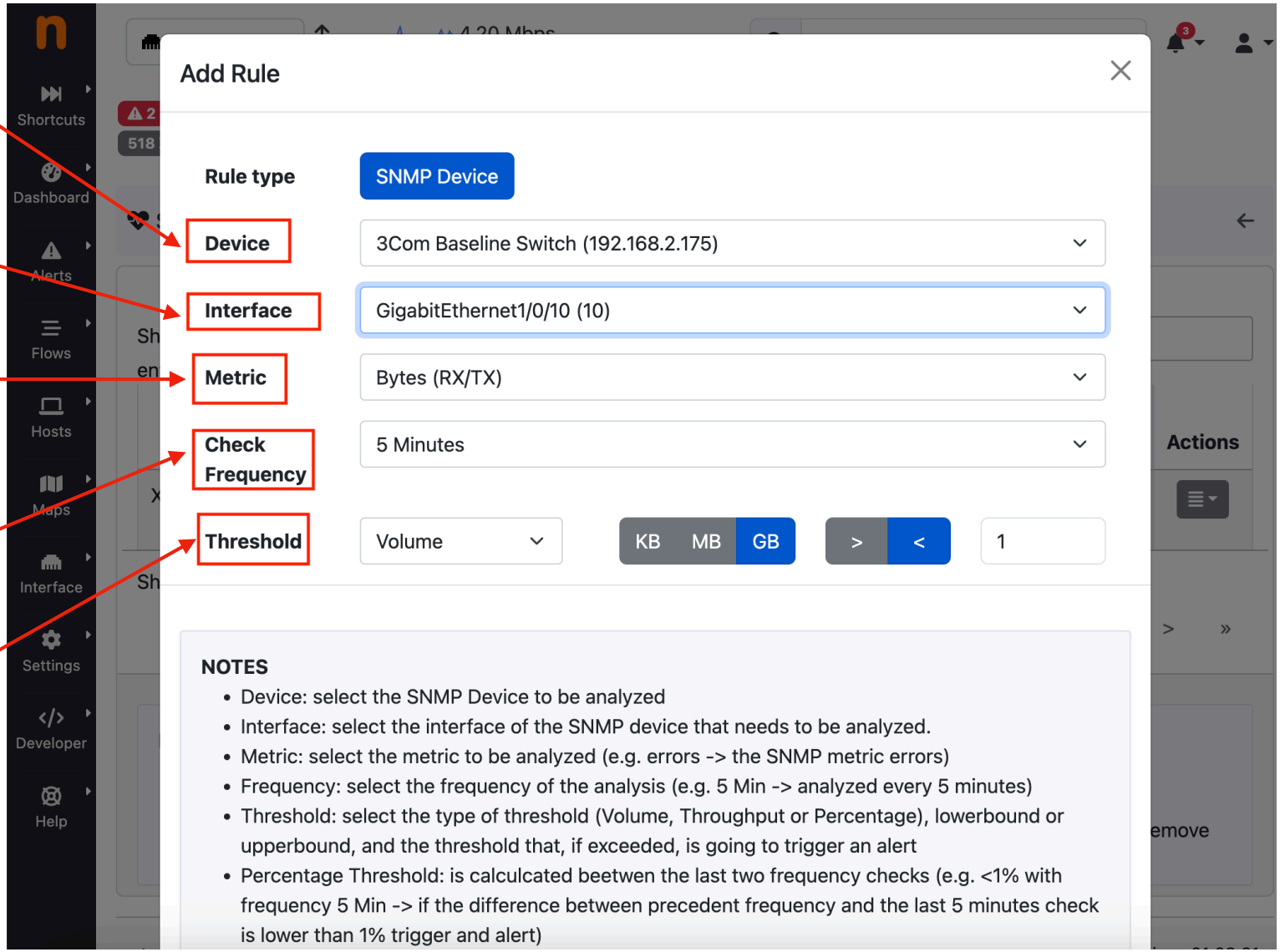
Select
the SNMP device

Select
the SNMP device port

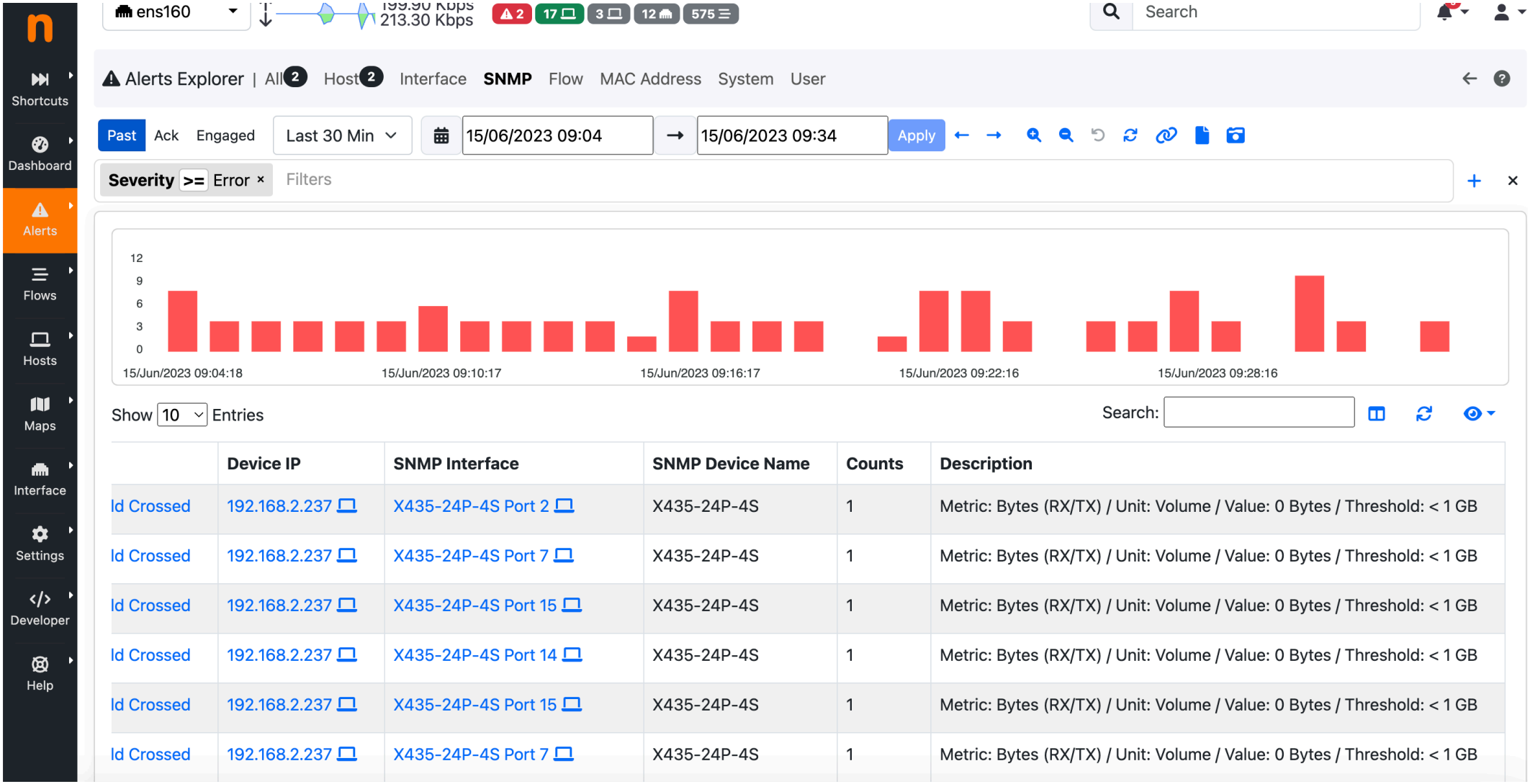
Select
the metric

Select
the check frequency

Select
the rule threshold



SNMP Devices Rules [3/3]



	Device IP	SNMP Interface	SNMP Device Name	Counts	Description
ld Crossed	192.168.2.237	X435-24P-4S Port 2	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB
ld Crossed	192.168.2.237	X435-24P-4S Port 7	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB
ld Crossed	192.168.2.237	X435-24P-4S Port 15	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB
ld Crossed	192.168.2.237	X435-24P-4S Port 14	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB
ld Crossed	192.168.2.237	X435-24P-4S Port 15	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB
ld Crossed	192.168.2.237	X435-24P-4S Port 7	X435-24P-4S	1	Metric: Bytes (RX/TX) / Unit: Volume / Value: 0 Bytes / Threshold: < 1 GB

Host/Interface Rules [1/3]

- Same as SNMP Rules but for hosts and interfaces.
- Frequency of 5 mins, 1 hour or 1 day.
- The triggered rules will emit a “Threshold Crossed” alert when a Host or a Network Interface exceeds (up or down) the specified threshold (Traffic, Score or Specific Application Traffic).
- Available only from Enterprise L license or superior.

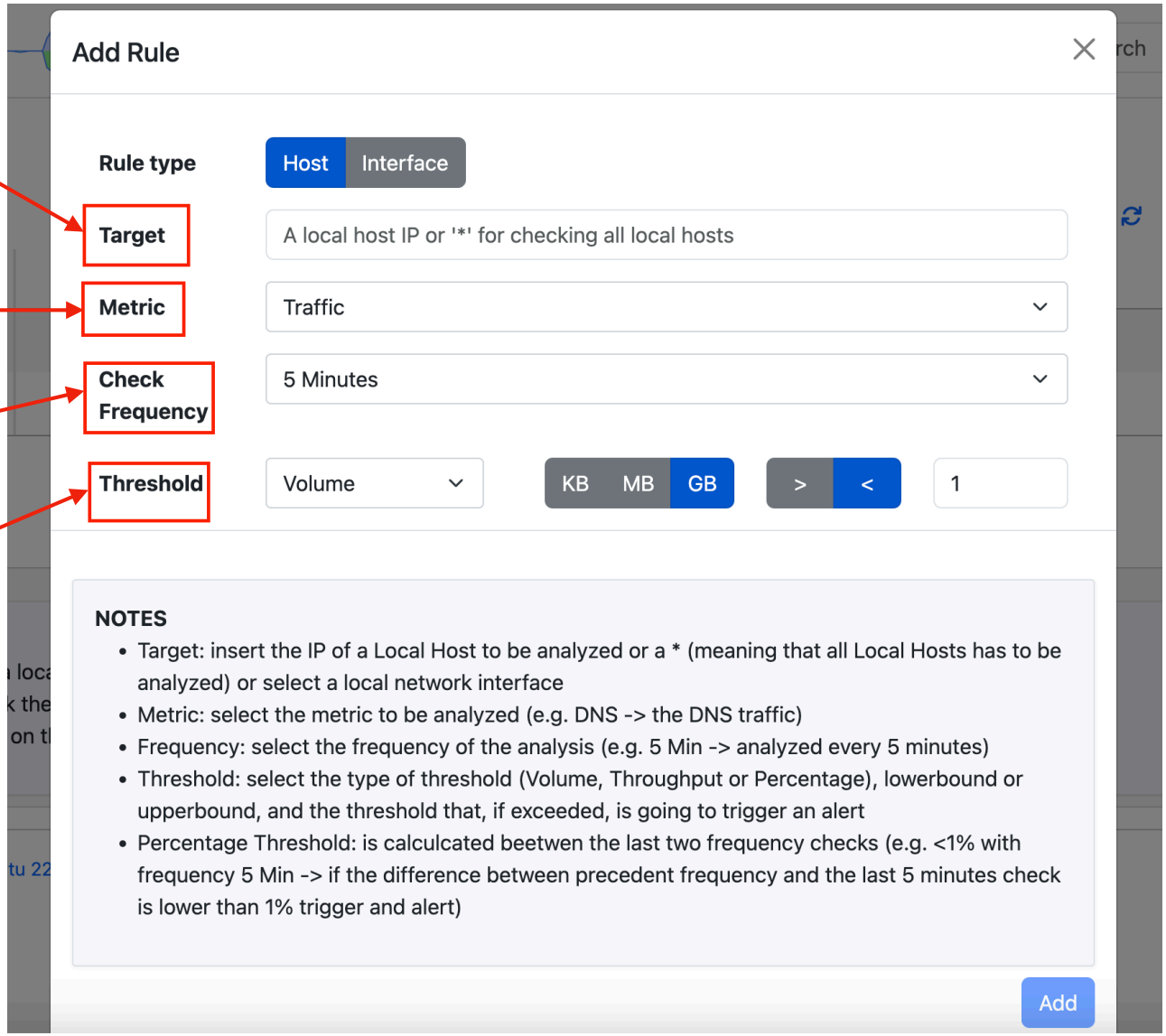
Host/Interface Rules [2/3]

In case of Rule Type Host
indicate the Host,
Otherwise select an Interface

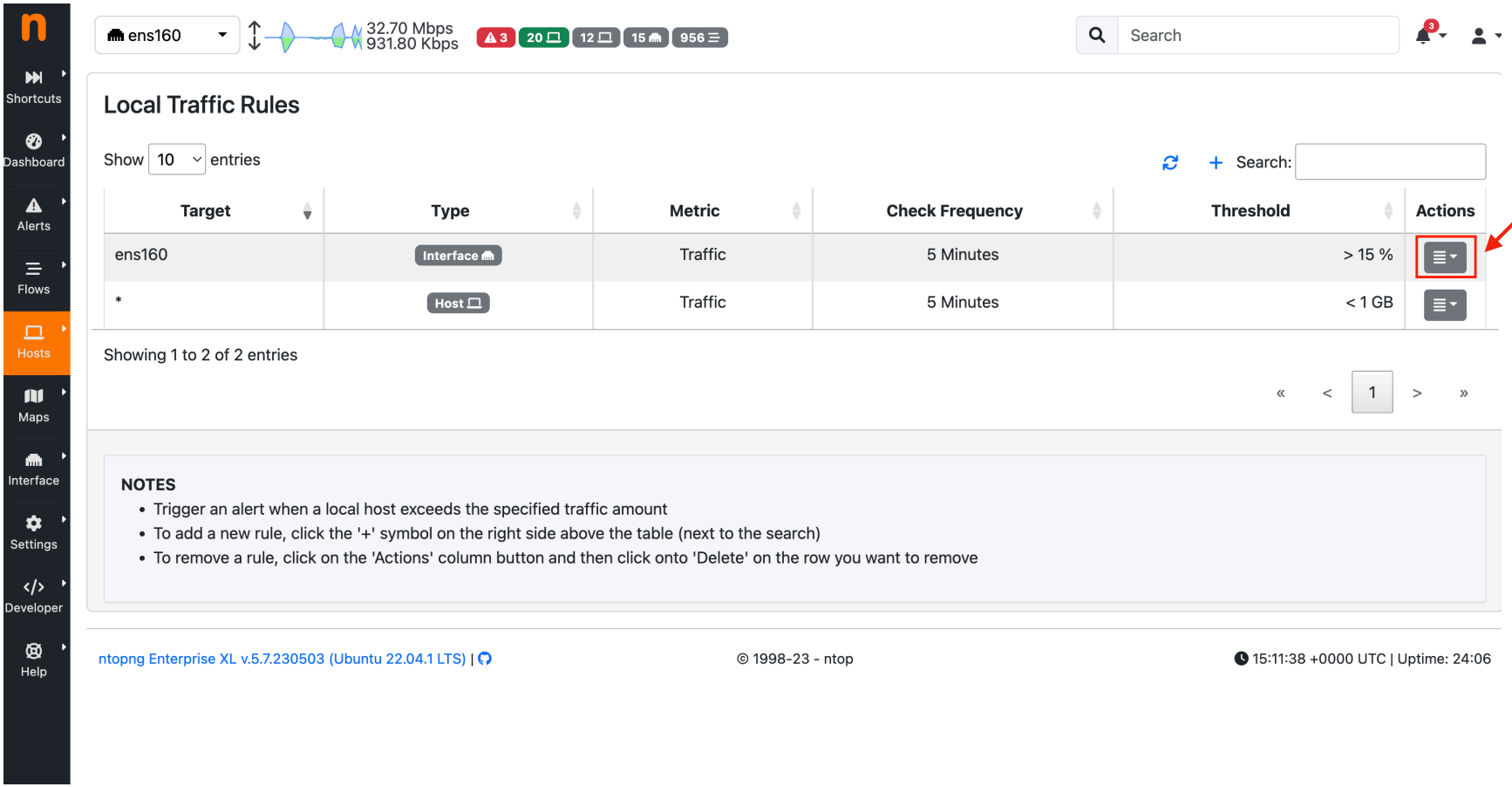
Select the metric

Select
the check frequency

Select the rule threshold



Host/Interface Rules [3/3]

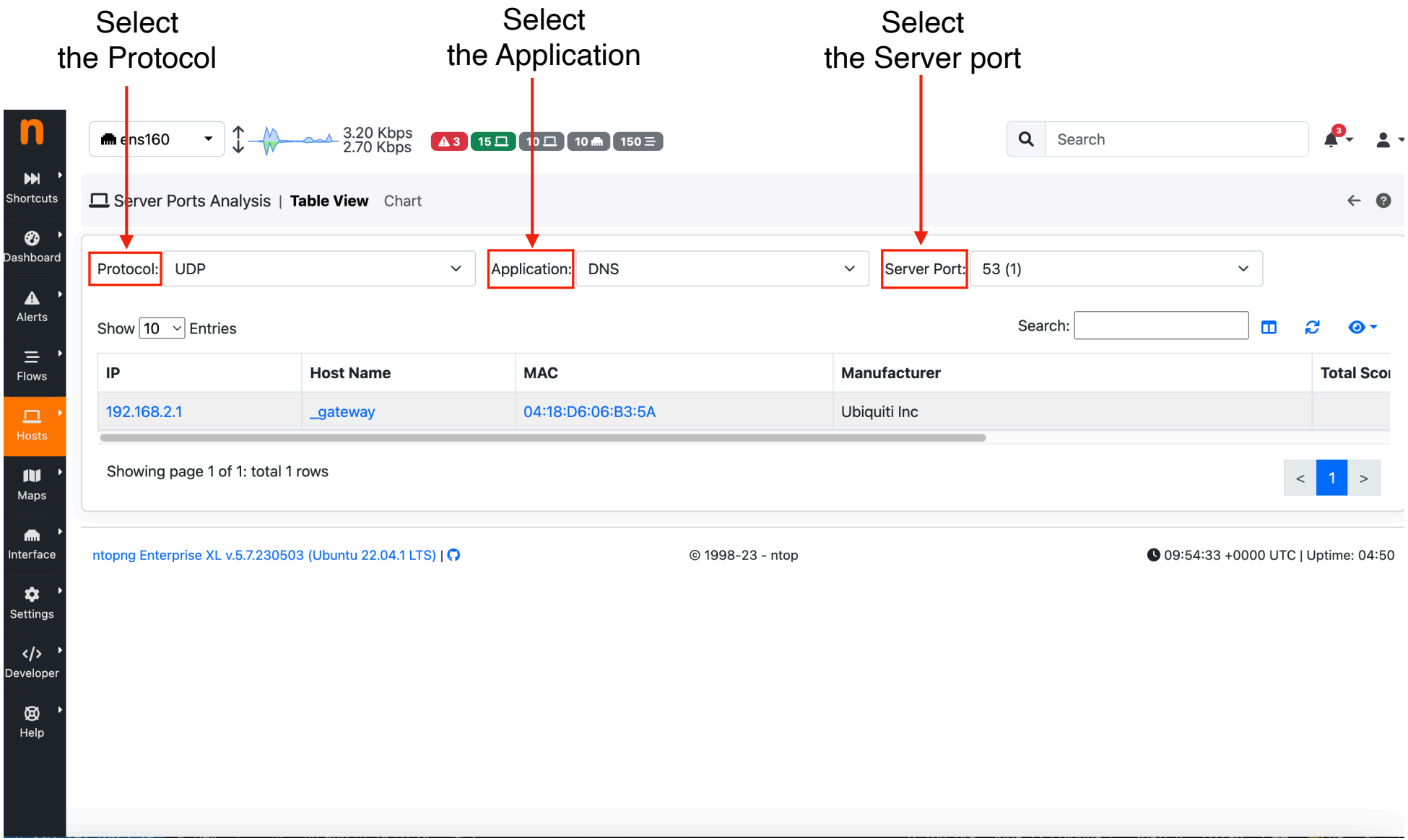


In Actions menu the edit and delete rule options are present

Server Ports Analysis [1/2]

- Monitoring available host services is not simple with live traffic view. On the other hand it is important to keep an eye on new or disappeared server port (service map).
- In order to enable it, start selecting a Network Protocol, then an Application Protocol and the server port.
- The page displays many server local host details including:
  - Host IP
  - Host Name
  - MAC address
  - Manufacturer
  - Host Total Score
  - Host Total Flows
  - Host Total Traffic.
- Available only from Enterprise L license or superior.

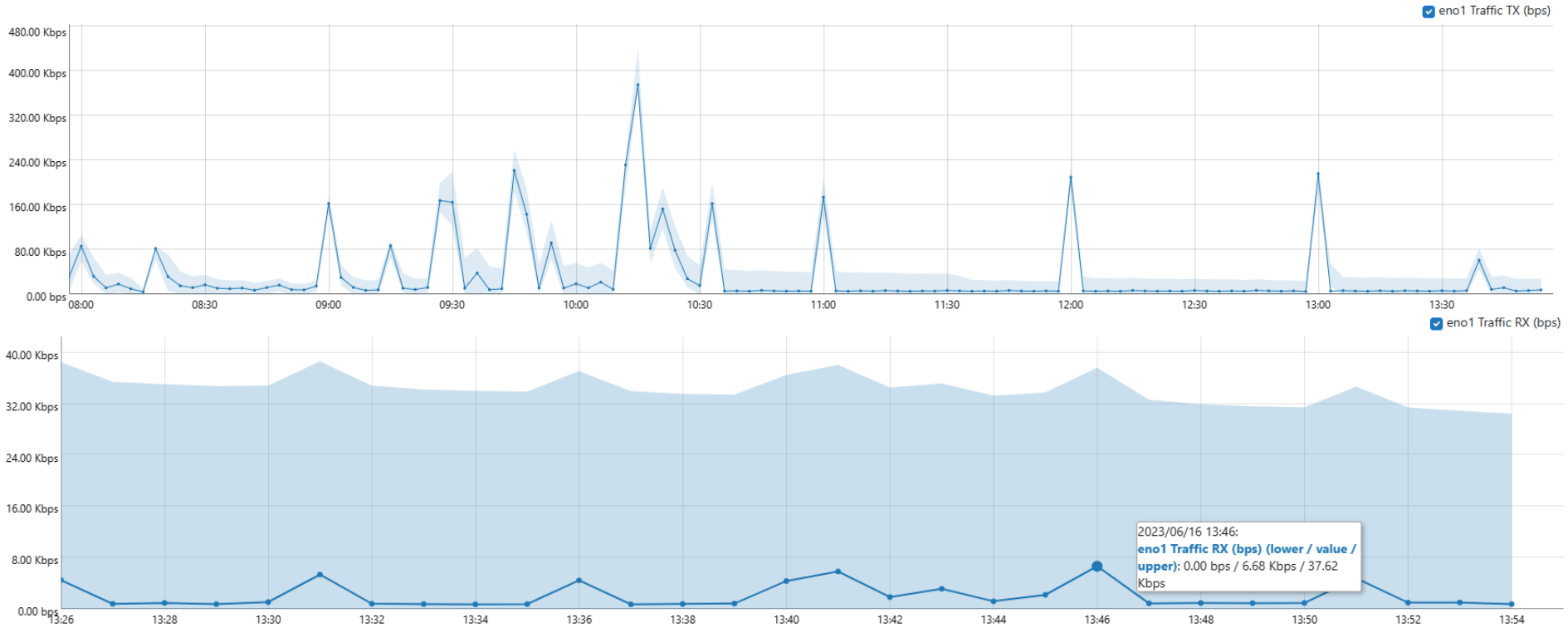
Server Ports Analysis [2/2]



Behavior Analysis
&
Inactive Hosts

Behavior Analysis (1/2)

- Use algorithms to understand and foresee the behaviors of hosts and interfaces
- See the actual value and the lower/upper bound of the foreseen value

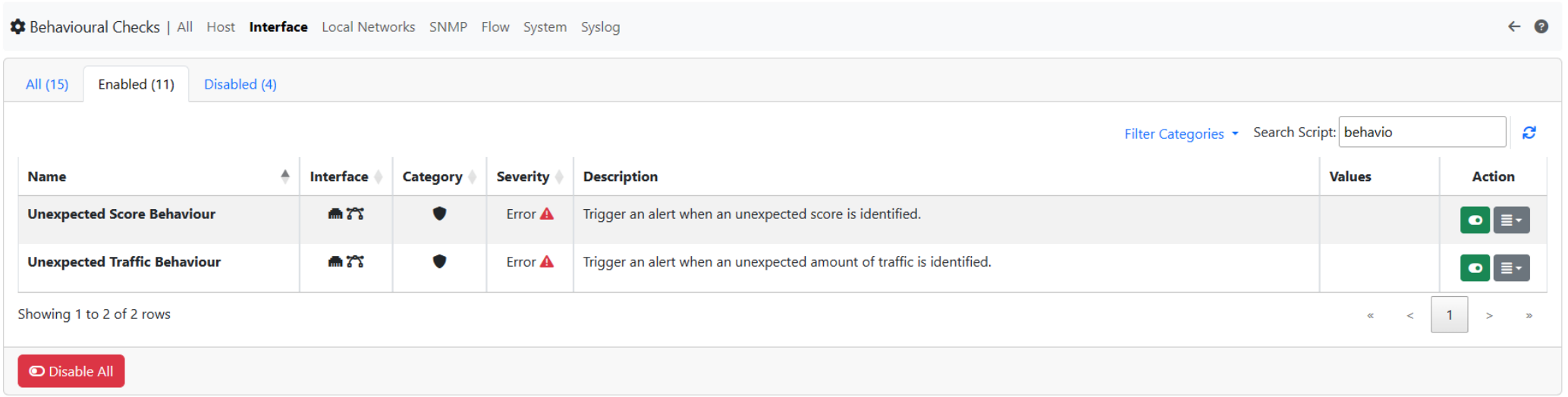


Behavior Analysis (2/2)

The value exceeds the lower or upper bound

↓

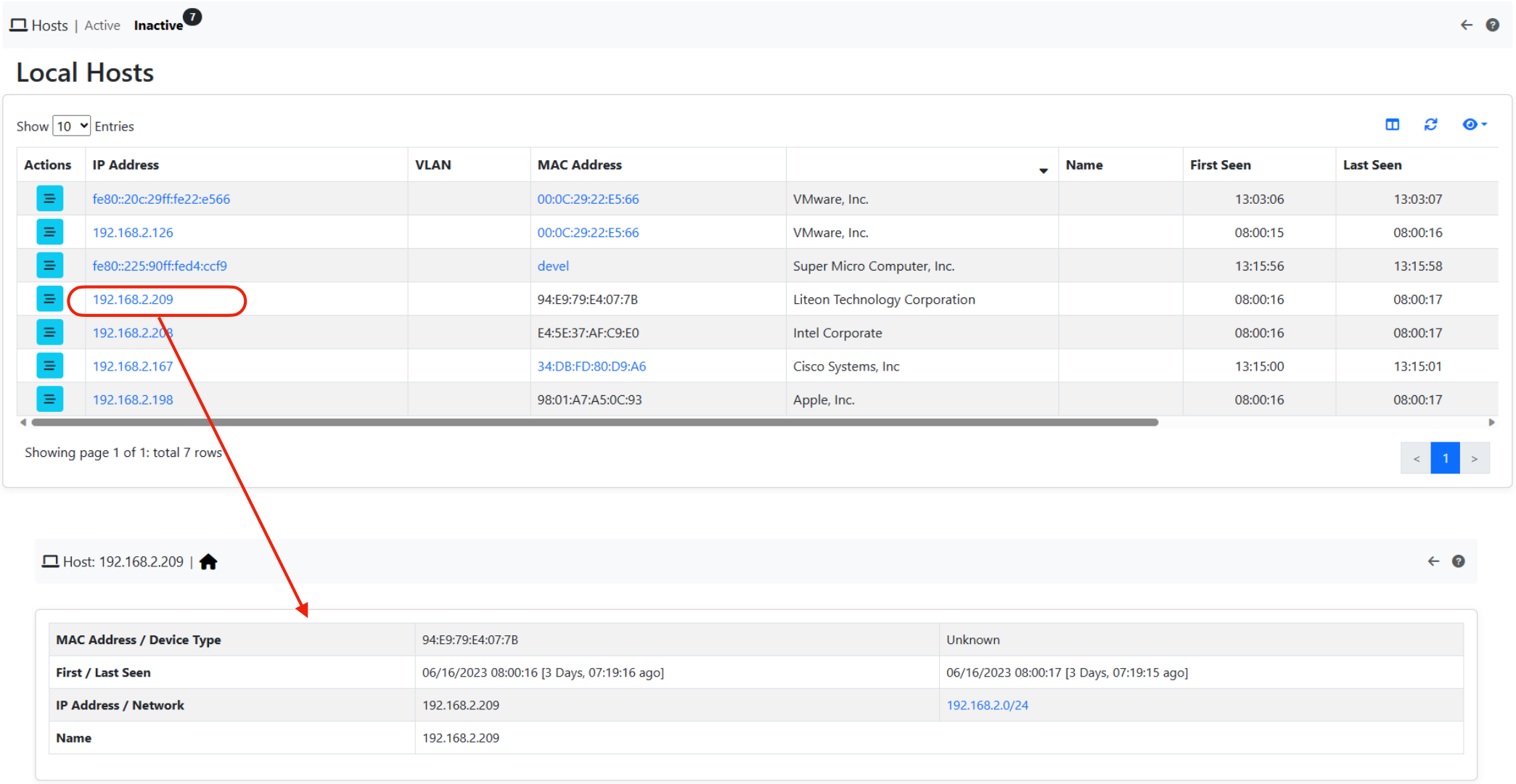
Trigger the corresponding alert



Inactive Hosts Analysis (1/2)

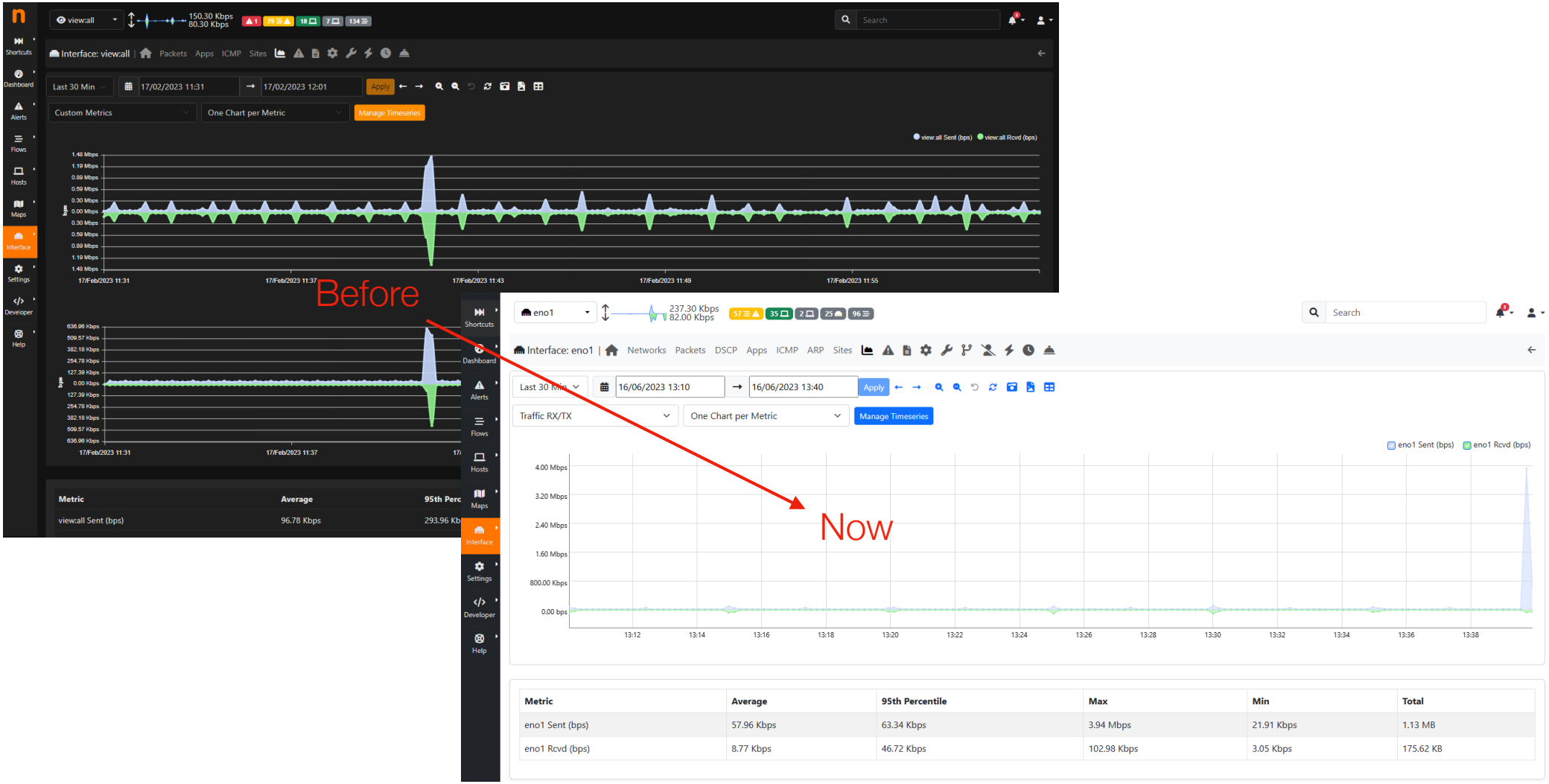
- Which Host is active and which is inactive?
- When was active the last time on the net?
- Which MAC address did it have?
- First time in ntopng that inactive data are shown (usually only live data are present)

Inactive Hosts Analysis (2/2)



ntopng New UI

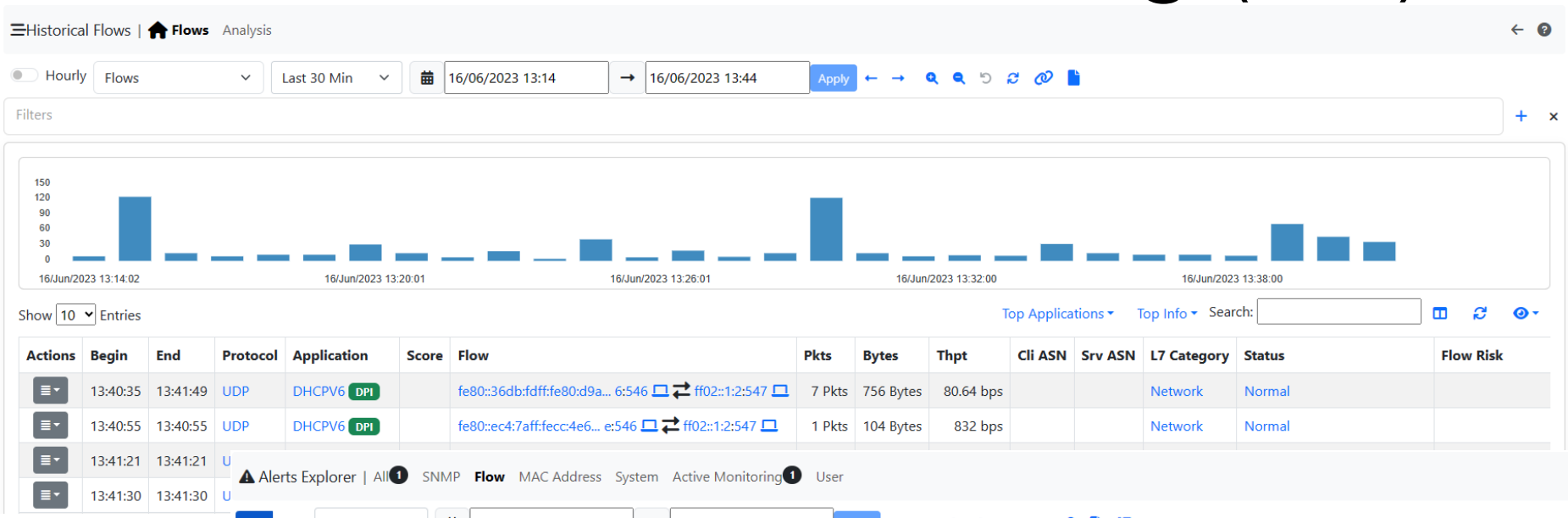
Timeseries (1/2)



Timeseries (1/2)

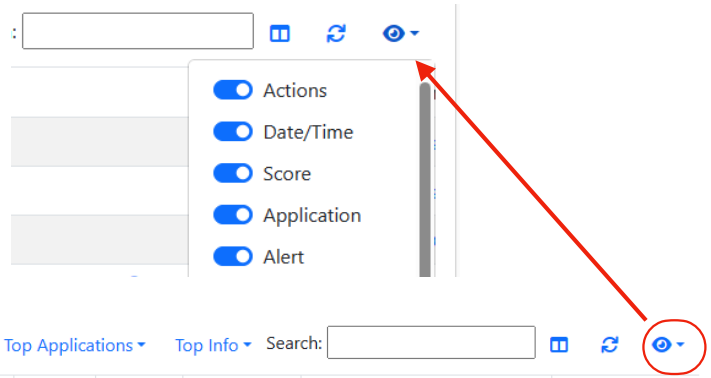
- Lowered loading time (4/5 s ~> below 1 s)
- More responsive
- More user friendly

Tables Refactoring (1/3)



Tables Refactoring (2/3)

- Reworked tables (homeproduct)
- Hastened loading
- Change the length of columns
- Remove/Add columns



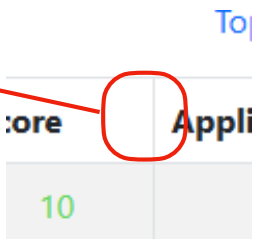
Show 10 Entries

Top Applications Top Info Search:

Actions	Begin	End	Protocol	Application	Score	Flow	Pkts	Bytes	Thpt	Cli ASN	Srv ASN	L7 Category	Status	Flow Risk
	13:40:35	13:41:49	UDP	DHCPV6 DPI		fe80::36db:fdff:fe80:d9a... 6:546 ff02::1:2:547	7 Pkts	756 Bytes	80.64 bps			Network	Normal	
	13:40:55	13:40:55	UDP	DHCPV6 DPI		fe80::ec4:7aff:fecc:4e6... e:546 ff02::1:2:547	1 Pkts	104 Bytes	832 bps			Network	Normal	
	13:41:21	13:41:21	UDP	DHCPV6 DPI		fe80::ec4:7aff:fecc:4c5... 3:546 ff02::1:2:547	1 Pkts	98 Bytes	784 bps			Network	Normal	
	13:41:30	13:41:30	UDP	DHCPV6 DPI		fe80::20c:29ff:fe96:455... c:546 ff02::1:2:547	1 Pkts	104 Bytes	832 bps			Network	Normal	
	13:41:48	13:41:48	IGMP	IGMP		192.168.1.2 224.0.0.251	2 Pkts	120 Bytes	960 bps			Network	Normal	
	13:41:12	13:41:12	UDP	Unknown		192.168.2.106:5678 broadcast:5678	1 Pkts	219 Bytes	1.75 kbps			Unspecified	Normal	
	13:41:50	13:41:50	IGMP	IGMP		192.168.2.134 224.0.0.251	2 Pkts	120 Bytes	960 bps			Network	Normal	

Tables Refactoring (3/3)

Click between columns and you can change the length of the columns



Actions	Date/Time	Score	Application	Alert	Flow	Description	Community ID
	13:40:18	10	UDP:DHCPV6 DPI	Periodic Flow	fe80::20c:29ff:fe37:d0... 5:546 ff02::1:2:547	Periodic Flow	1:4EaAxWqS7ipjwI
	13:42:12	10	UDP:DHCPV6 DPI	Periodic Flow	fe80::20c:29ff:fe37:d0... 5:546 ff02::1:2:547	Periodic Flow	1:4EaAxWqS7ipjwI
	13:40:14	10	UDP:NetBIOS.SMBv1 DPI	Periodic Flow	192.168.2.98:138 192.168.2.255:138	Periodic Flow	1:70CqD4CQDAltH
	13:39:51	60	TCP:HTTP.ntop DPI	Known Proto on Non Std Port	192.168.2.153:60622 devel:3001	Known Proto on Non Std Port	1:ksEOkZ0R4pjp/z
	13:39:52	60	TCP:HTTP.ntop DPI	Known Proto on Non Std Port	192.168.2.153:60623 devel:3001	Known Proto on Non Std Port	1:OhKxNyUOMlL9
	13:39:52	60	TCP:HTTP DPI	Known Proto on Non Std Port	192.168.2.153:60627 devel:3001	Known Proto on Non Std Port	1:pw5kWo459QG+
	13:39:52	60	TCP:HTTP DPI	Known Proto on Non Std Port	192.168.2.153:60628 devel:3001	Known Proto on Non Std Port	1:sVh3OHEU7cEtG
	13:39:52	60	TCP:HTTP DPI	Known Proto on Non Std Port	192.168.2.153:60630 devel:3001	Known Proto on Non Std Port	1:w/3dy9whiLBigw
	13:39:52	60	TCP:HTTP DPI	Known Proto on Non Std Port	192.168.2.153:60626 devel:3001	Known Proto on Non Std Port	1:nJBHtWzOiXqqsl
	13:39:52	60	TCP:HTTP DPI	Known Proto on Non Std Port	192.168.2.153:60629 devel:3001	Known Proto on Non Std Port	1:ihfCpjLxe4P/l856

Actions	Date/Time	Score	Application	Alert	Flow	Description
	13:40:18	10	UDP:DHCP...	Periodic Flow	fe80::20c:29ff:fe37:d0... 5:546 ff02::1:2:547	Periodic Flow
	13:42:12	10	UDP:DHCP...	Periodic Flow	fe80::20c:29ff:fe37:d0... 5:546 ff02::1:2:547	Periodic Flow
	13:40:14	10	UDP:NetBI...	Periodic Flow	192.168.2.98:138 192.168.2.255:138	Periodic Flow
	13:39:51	60	TCP:HTTP....	Known Proto on Non Std Port	192.168.2.153:60622 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP....	Known Proto on Non Std Port	192.168.2.153:60623 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP ...	Known Proto on Non Std Port	192.168.2.153:60627 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP ...	Known Proto on Non Std Port	192.168.2.153:60628 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP ...	Known Proto on Non Std Port	192.168.2.153:60630 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP ...	Known Proto on Non Std Port	192.168.2.153:60626 devel:3001	Known Proto on Non Std Port
	13:39:52	60	TCP:HTTP ...	Known Proto on Non Std Port	192.168.2.153:60629 devel:3001	Known Proto on Non Std Port

Smart Recording

Continuous Recording

- In most cases it's not possible to predict when a network event occurs
- In order to drill down up to the packet level:
  - We need to record traffic 24/7
  - On-demand capture is not an option

Data Retention

- Data retention depends on traffic rate and storage size
- Example:

Traffic rate	10 Gbps
Data on disk	1,2 GB/s
Data on disk	4 TB/h
Data on disk	100 TB/day

- 10x at 100 Gbps

Saving Space

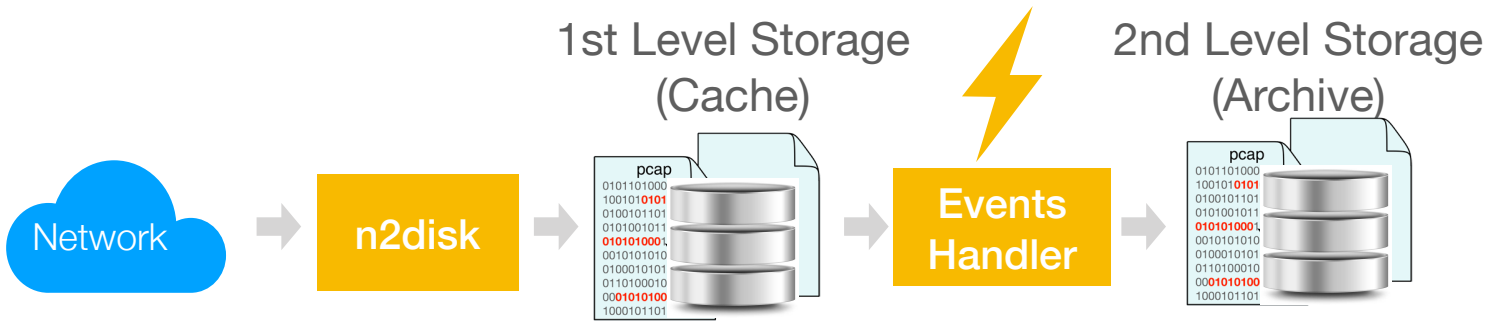
- Packet compression: save up to 5% on Internet traffic (more on LAN traffic)
- Packet slicing: good if interested in headers only
- BPF filtering: difficult to predict
- L7 filtering: good to discard or shunt unwanted traffic (e.g. encrypted, compressed, multimedia)

Not all traffic is alike

- What if our storage does not satisfy the desired data retention, even after filtering?
- Assumption: traffic matching Network events is more important then the rest of the traffic
- What we need is:
  - Prioritize selected traffic (e.g. security alerts)
  - Smart data recycling: delete traffic which is not matching any event first

Smart Data Retention

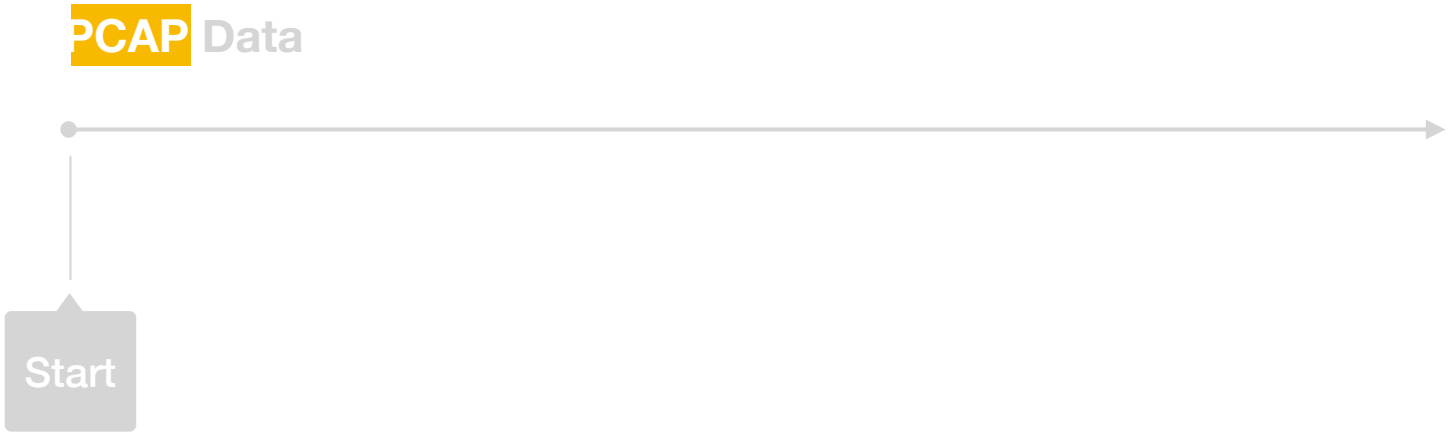
- Process Network events generated by ntopng
- Use a 1st level storage to implement continuous recording with a short data retention (cache)
- Use a 2nd level storage to archive traffic for Network events with a longer data retention (archive)



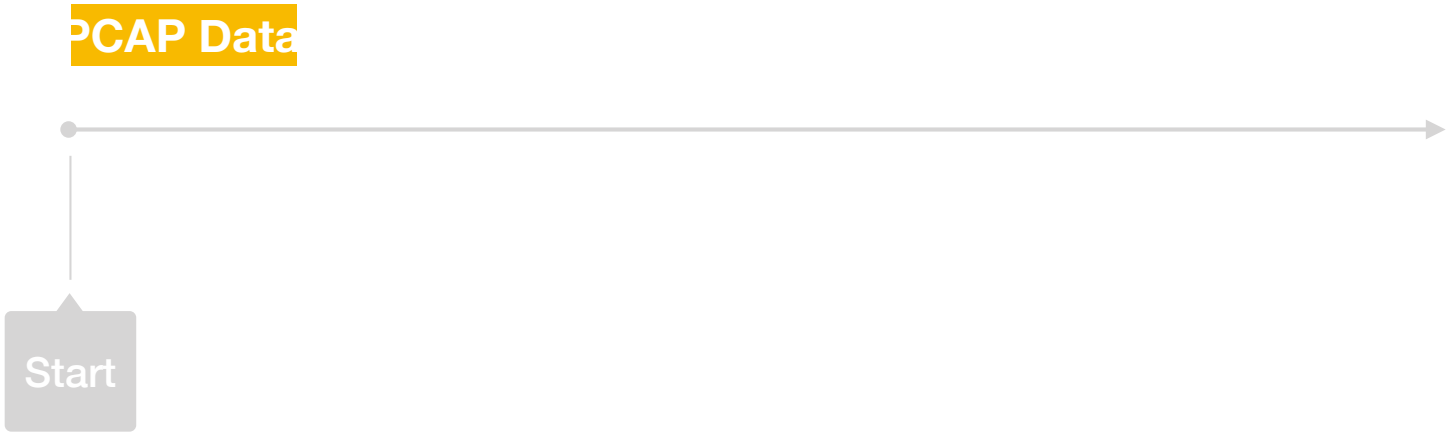
Continuous Recording

Continuous Recording

Continuous Recording



Continuous Recording



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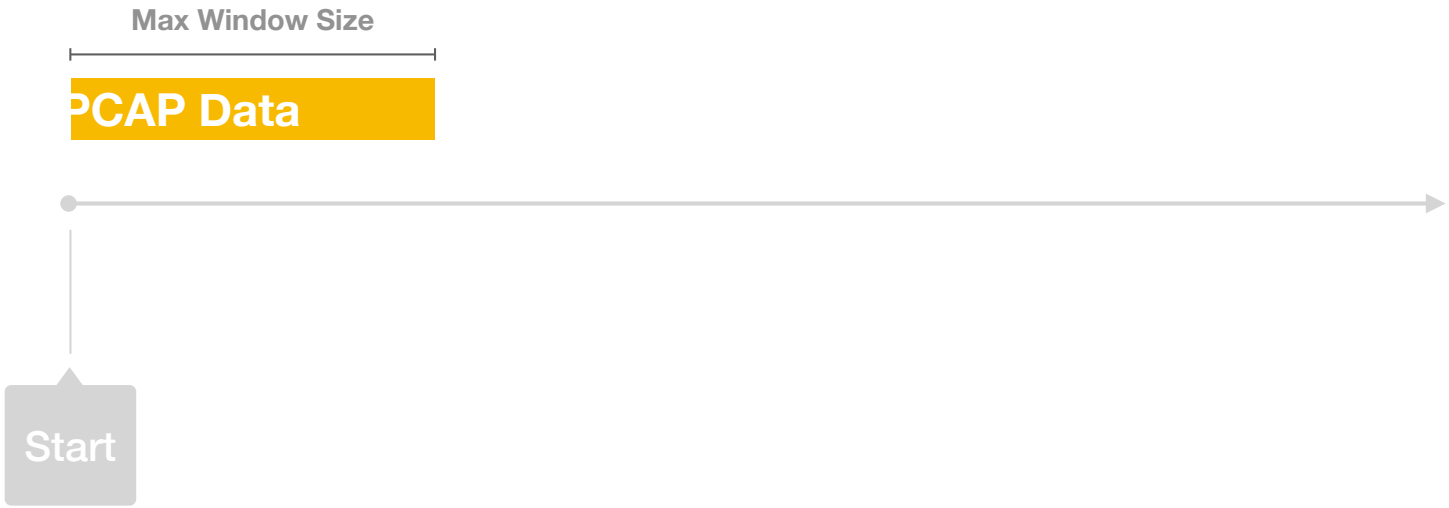
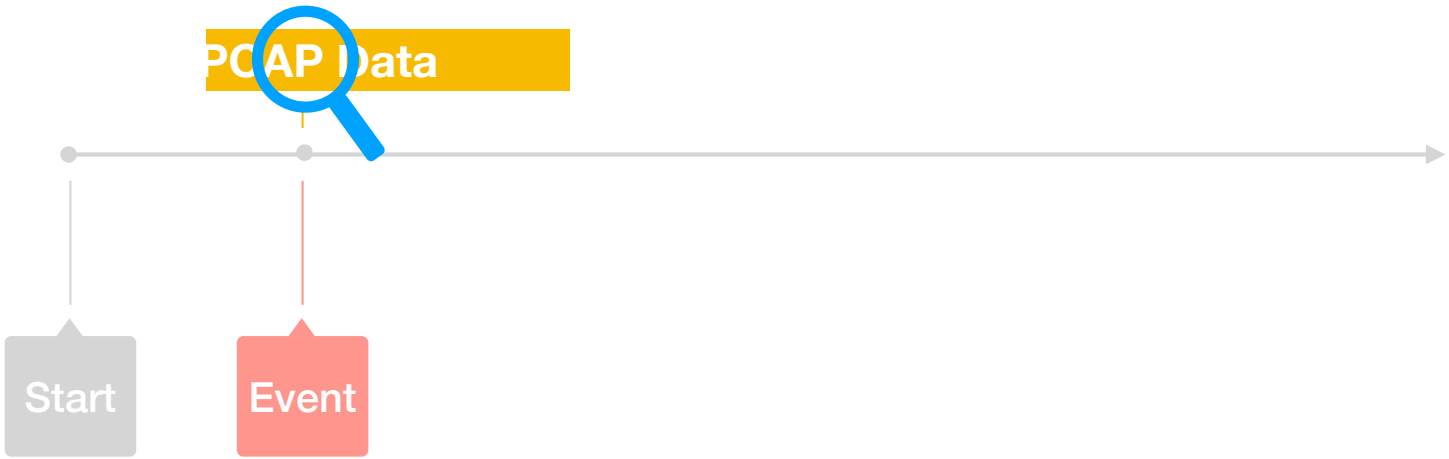


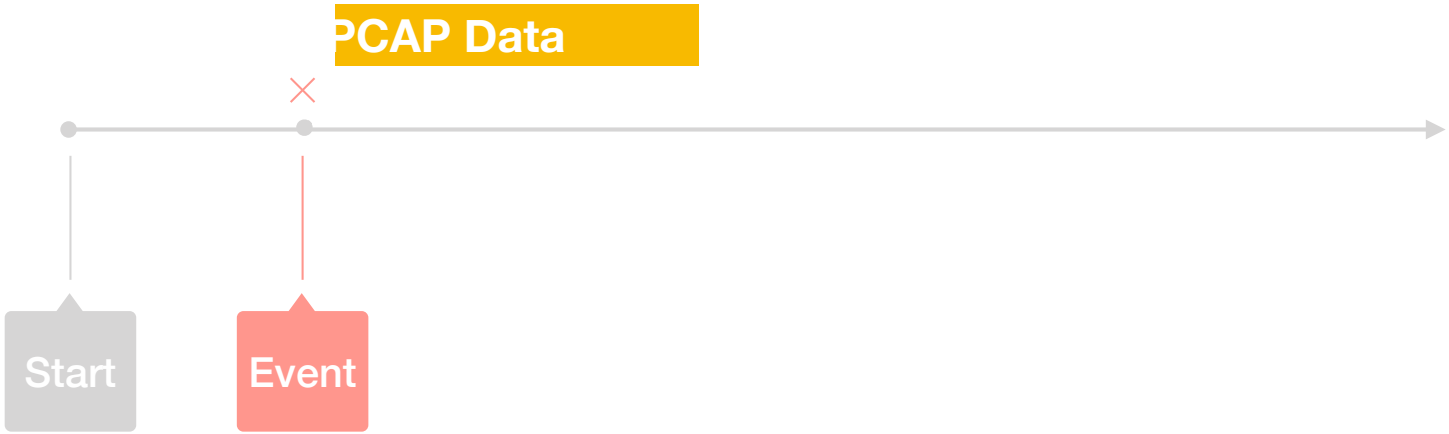
Continuous Recording

Continuous Recording

Continuous Recording



Continuous Recording



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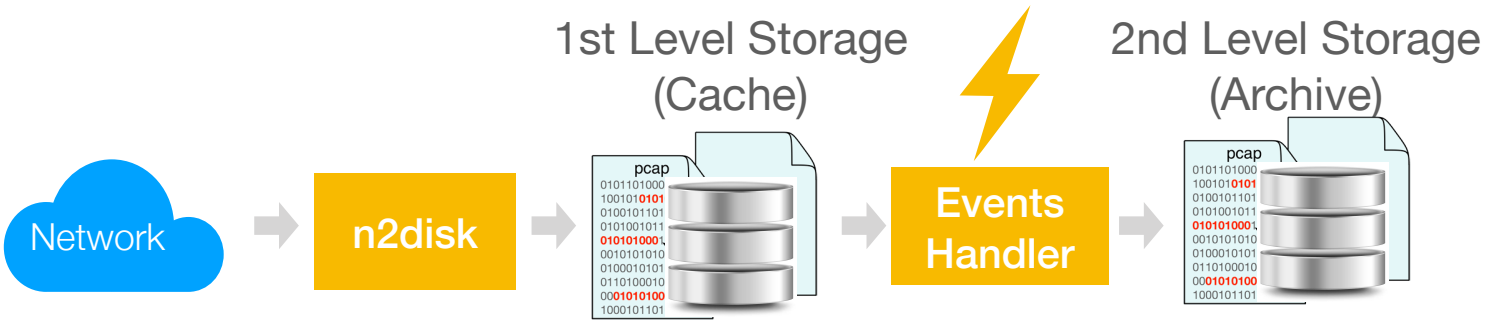
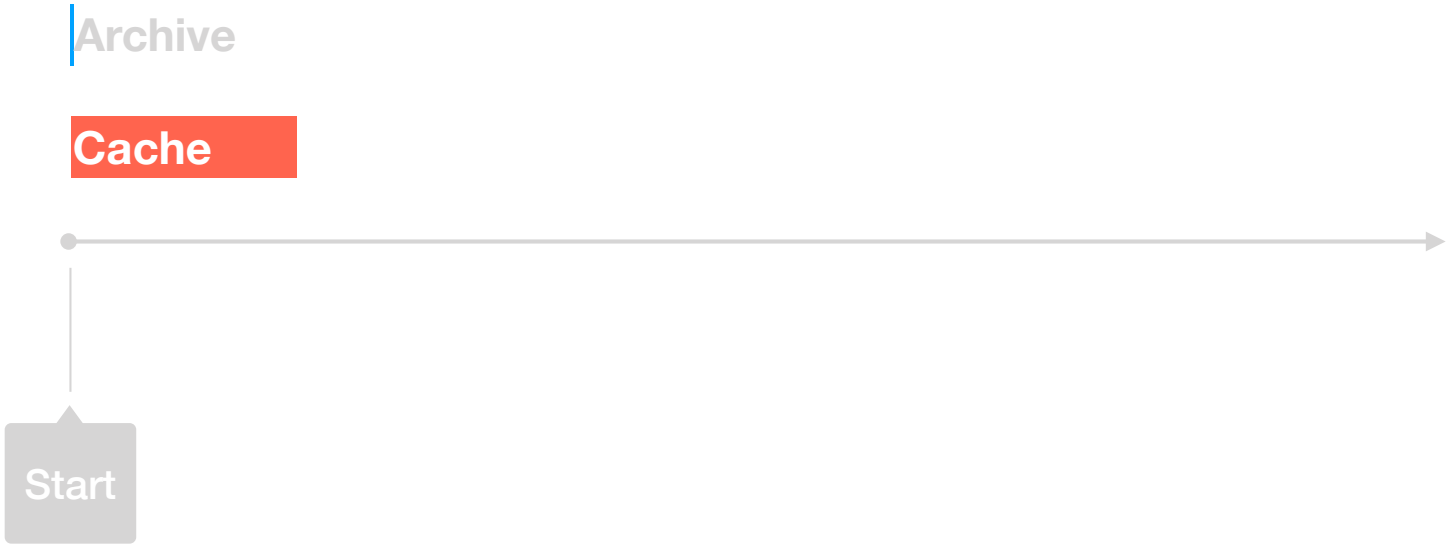


Smart Recording

Smart Recording



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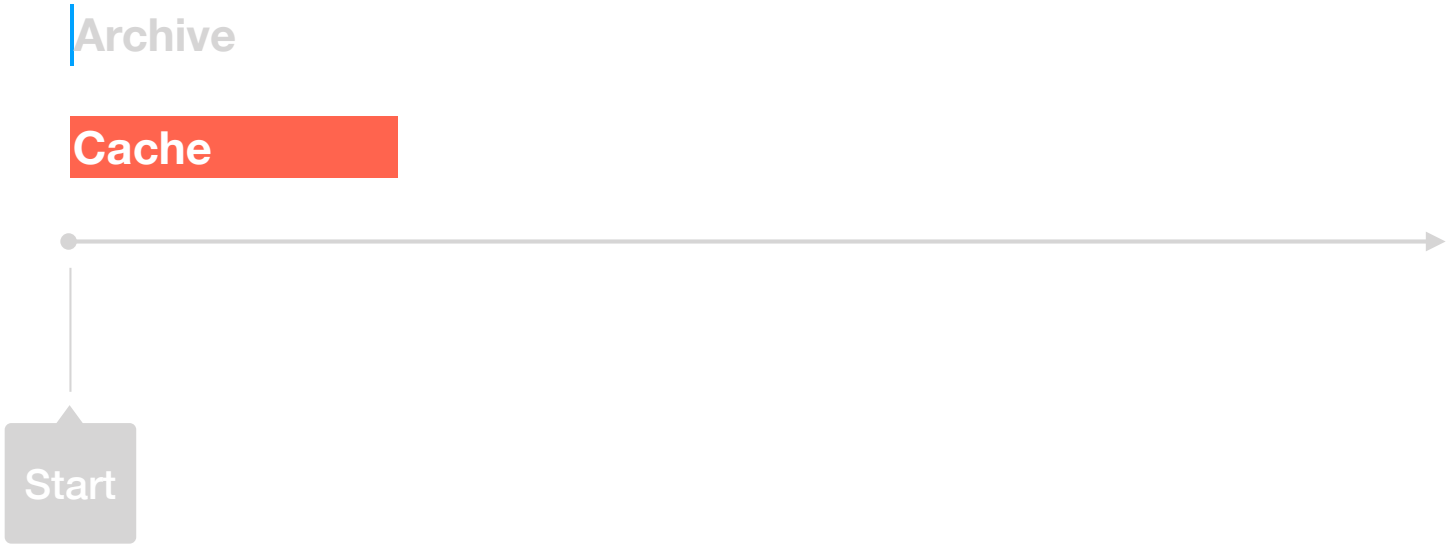

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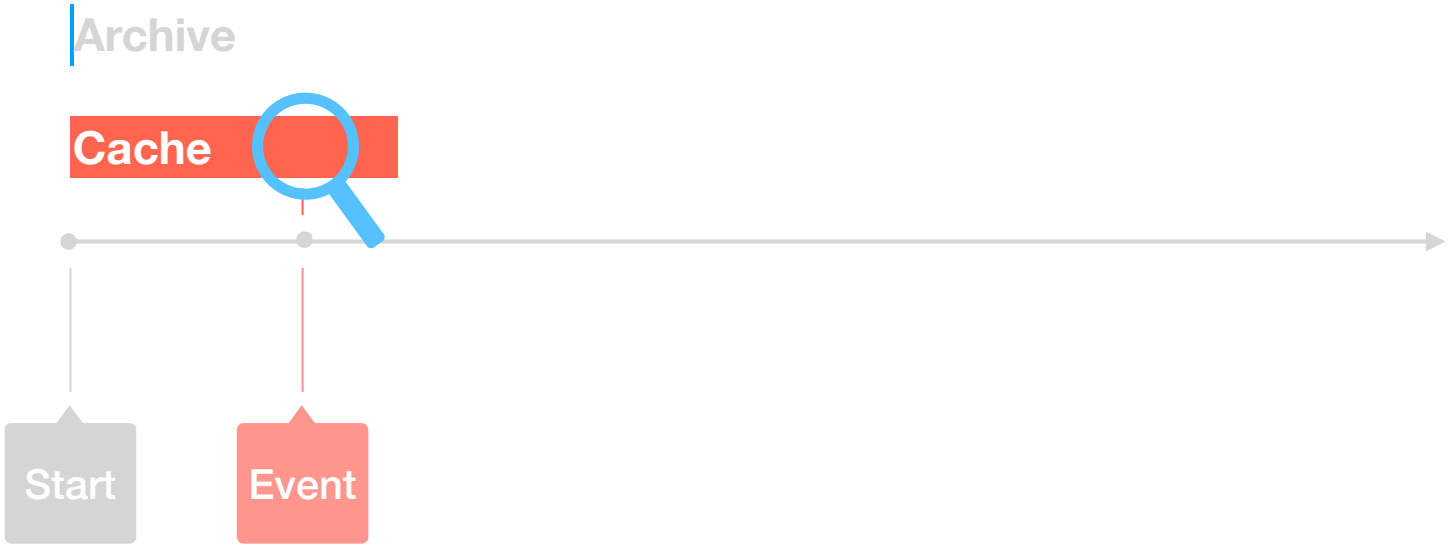

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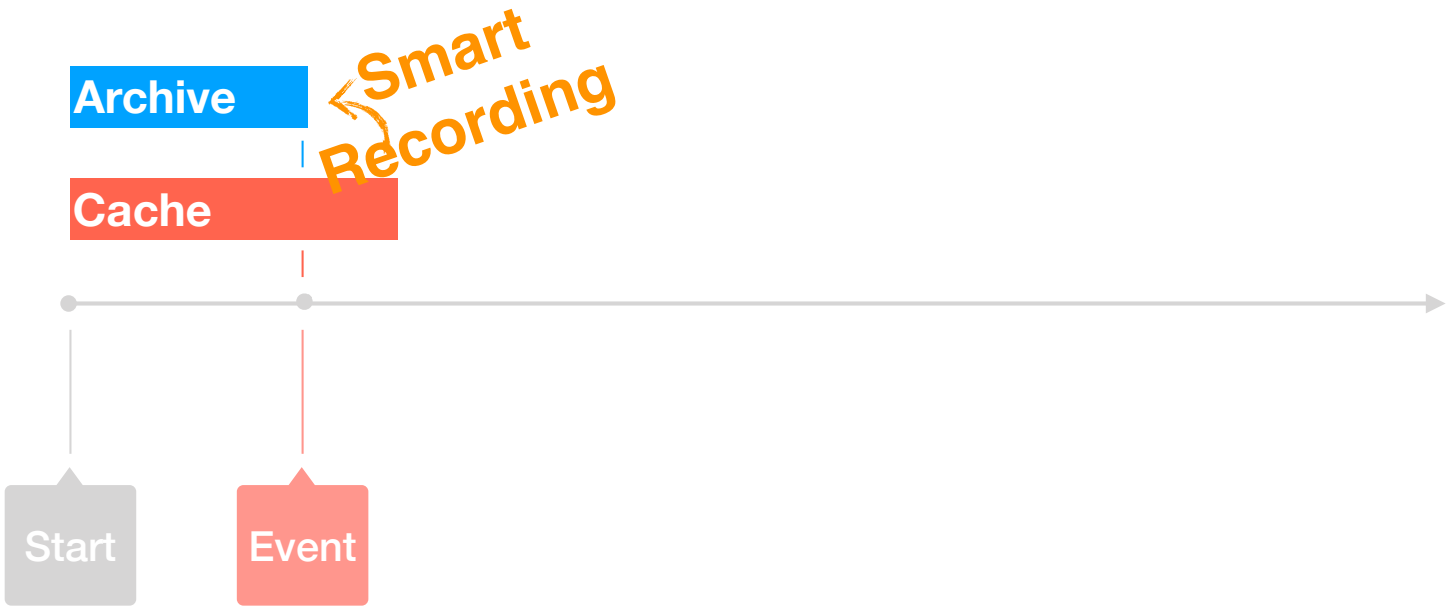

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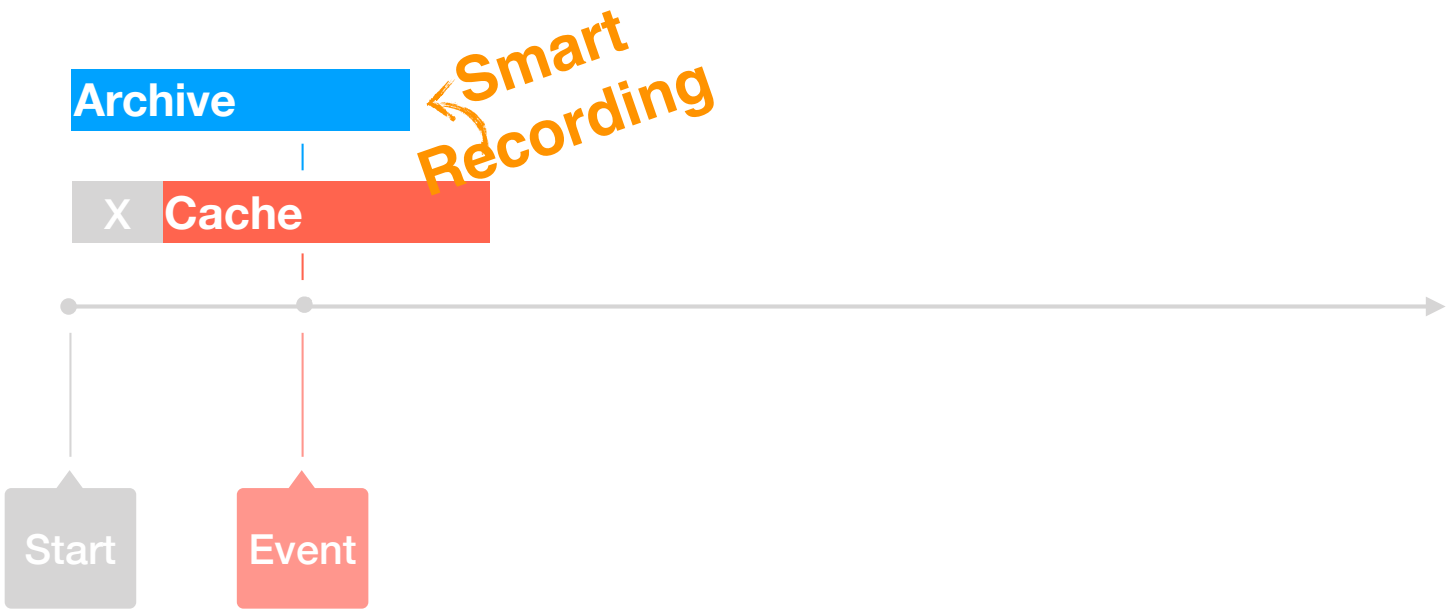

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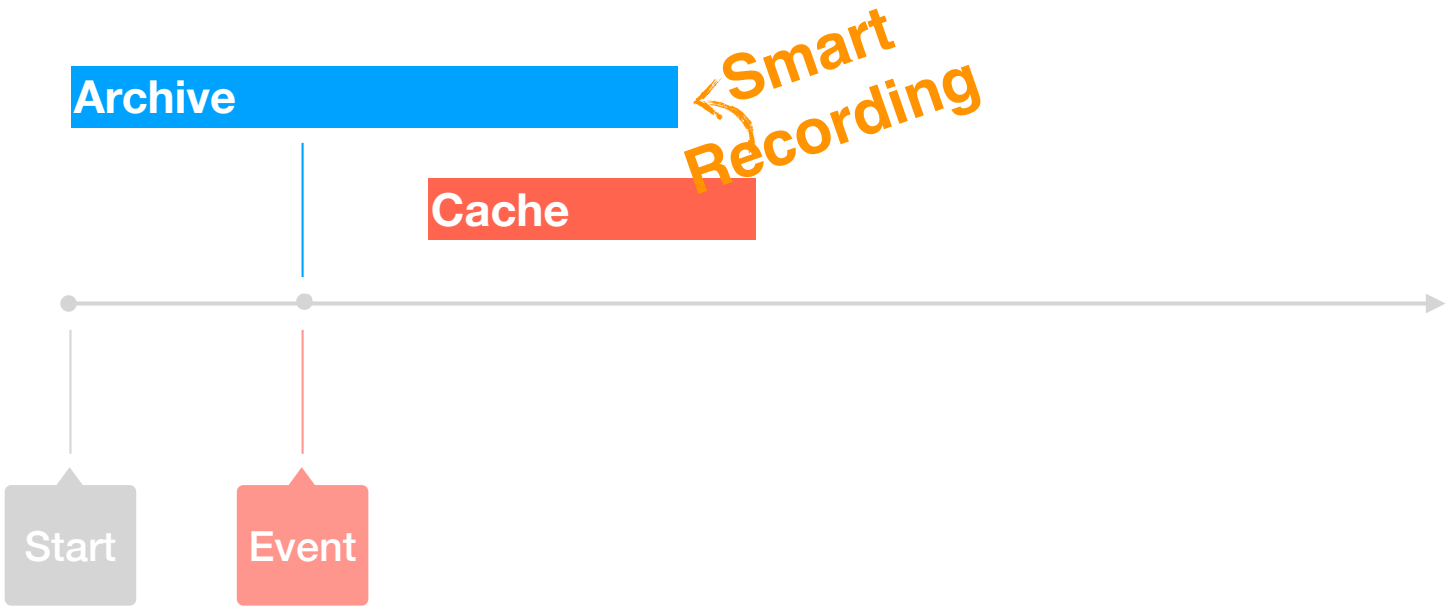

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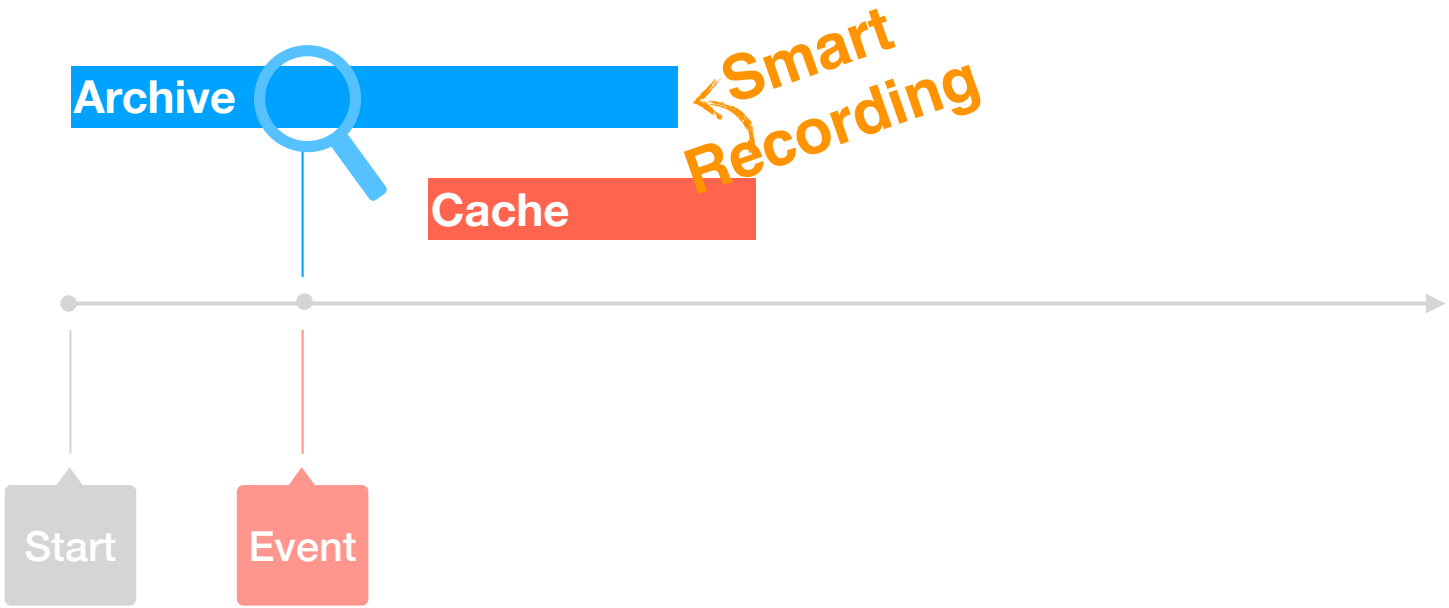

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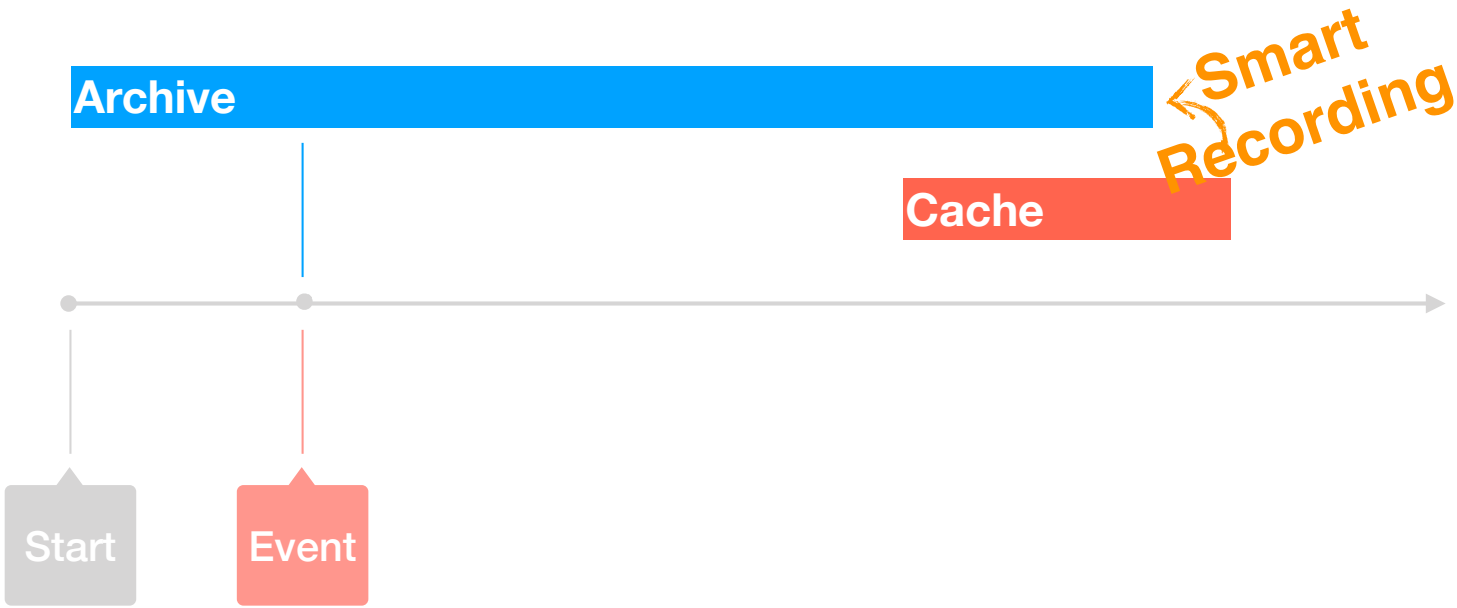
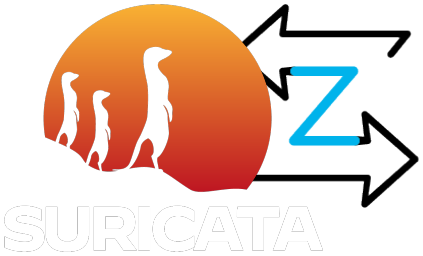


Smart Recording

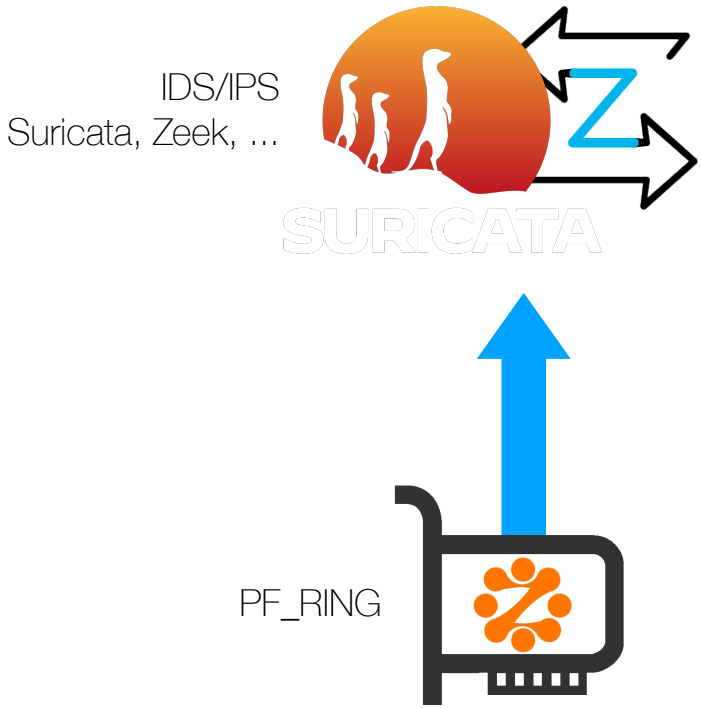
Suricata and Zeek at 100 Gbit

IDS Acceleration

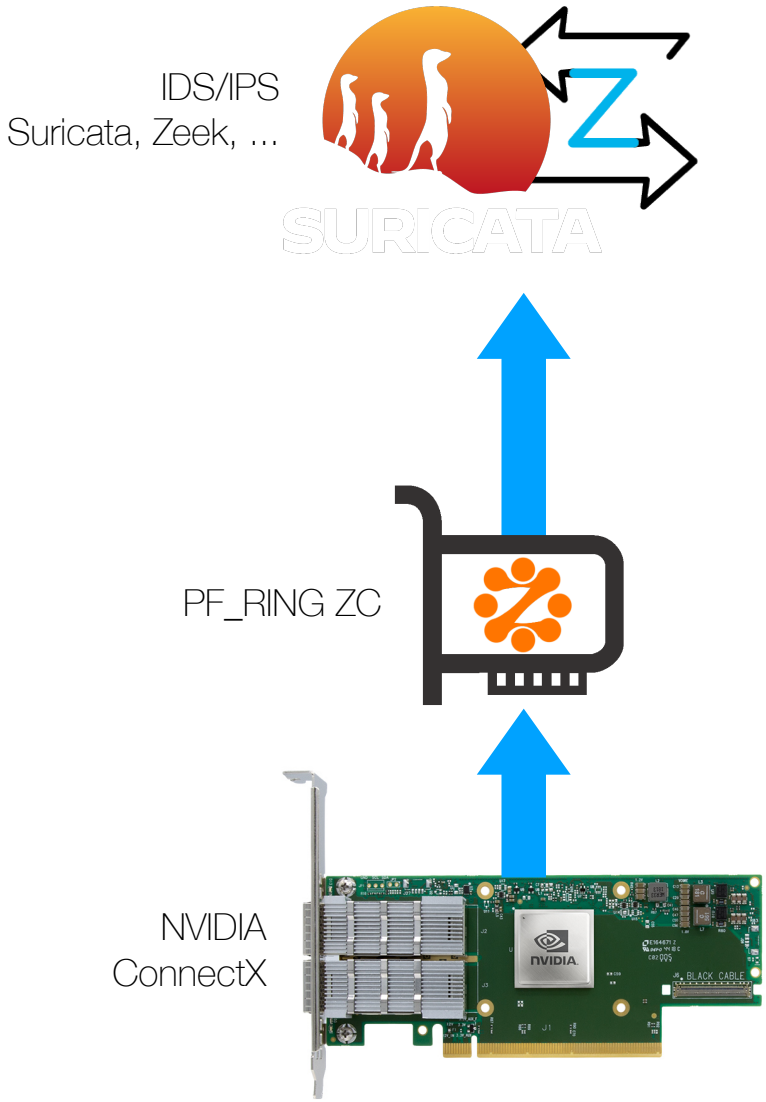
IDS/IPS
Suricata, Zeek, ...



IDS Acceleration



IDS Acceleration



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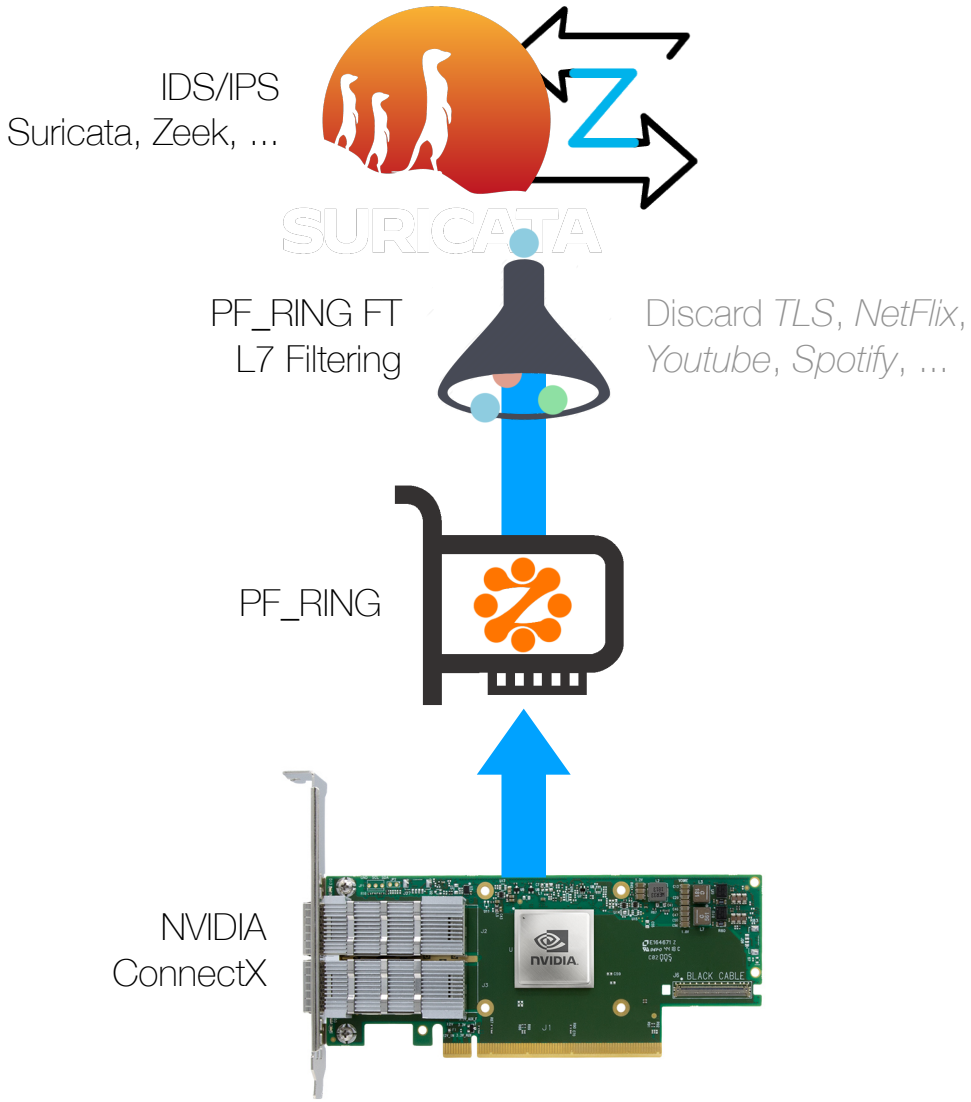
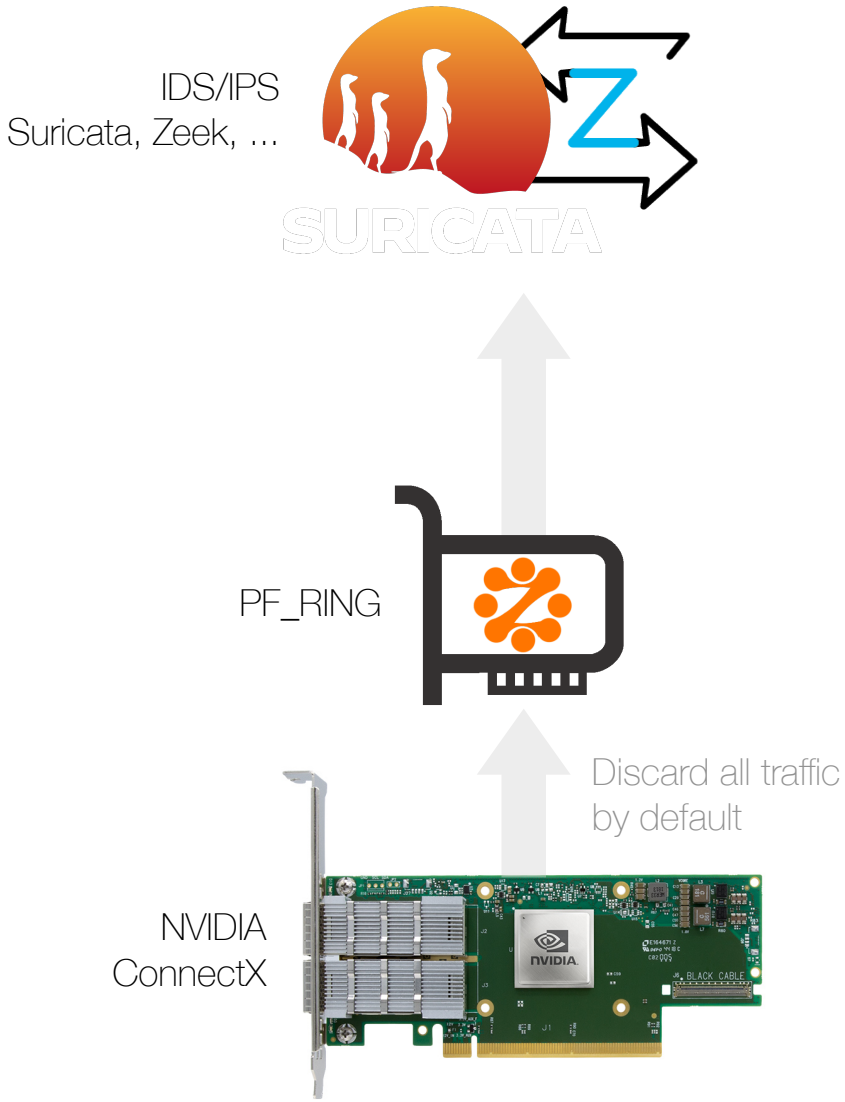


Suricata and Zeek On Demand



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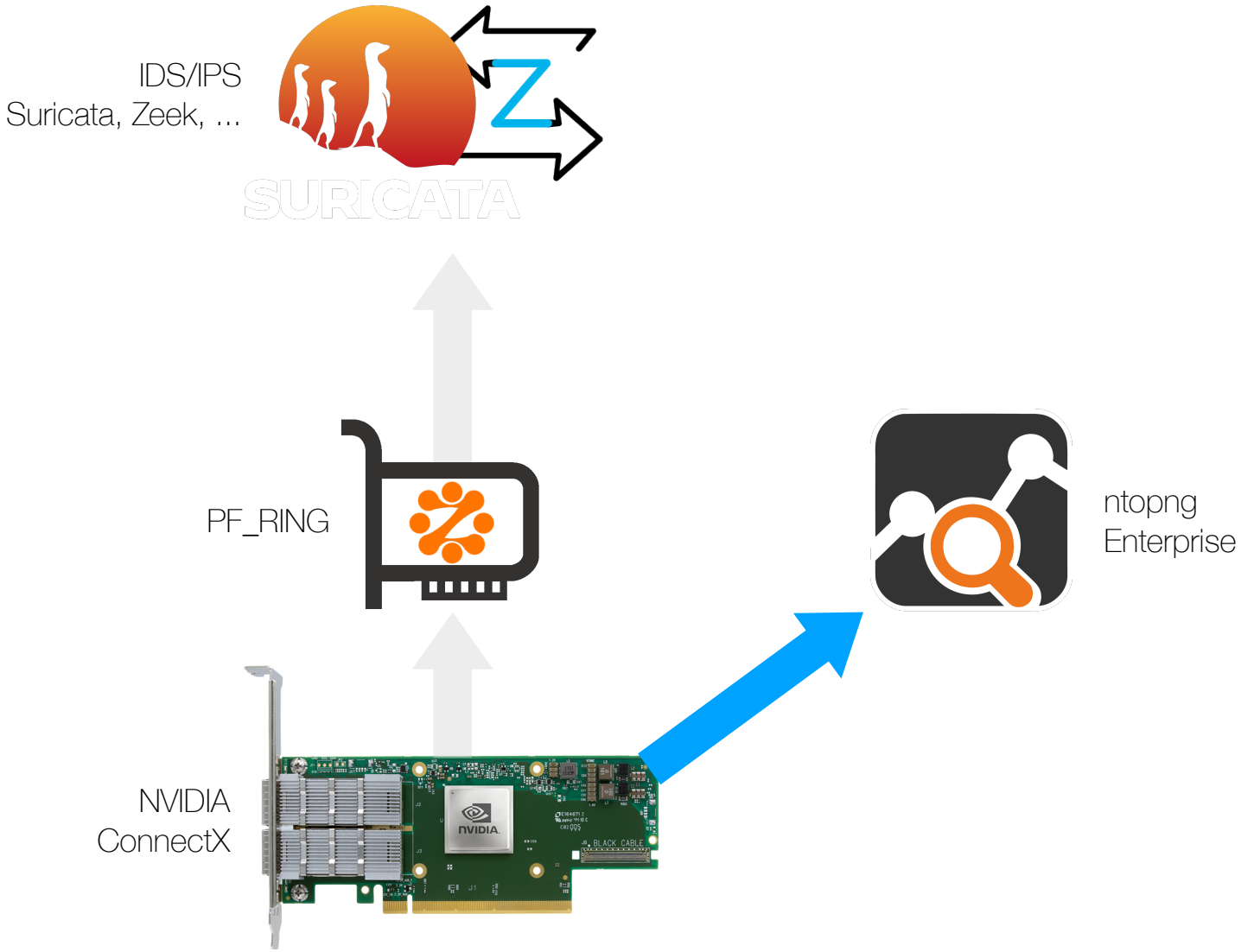

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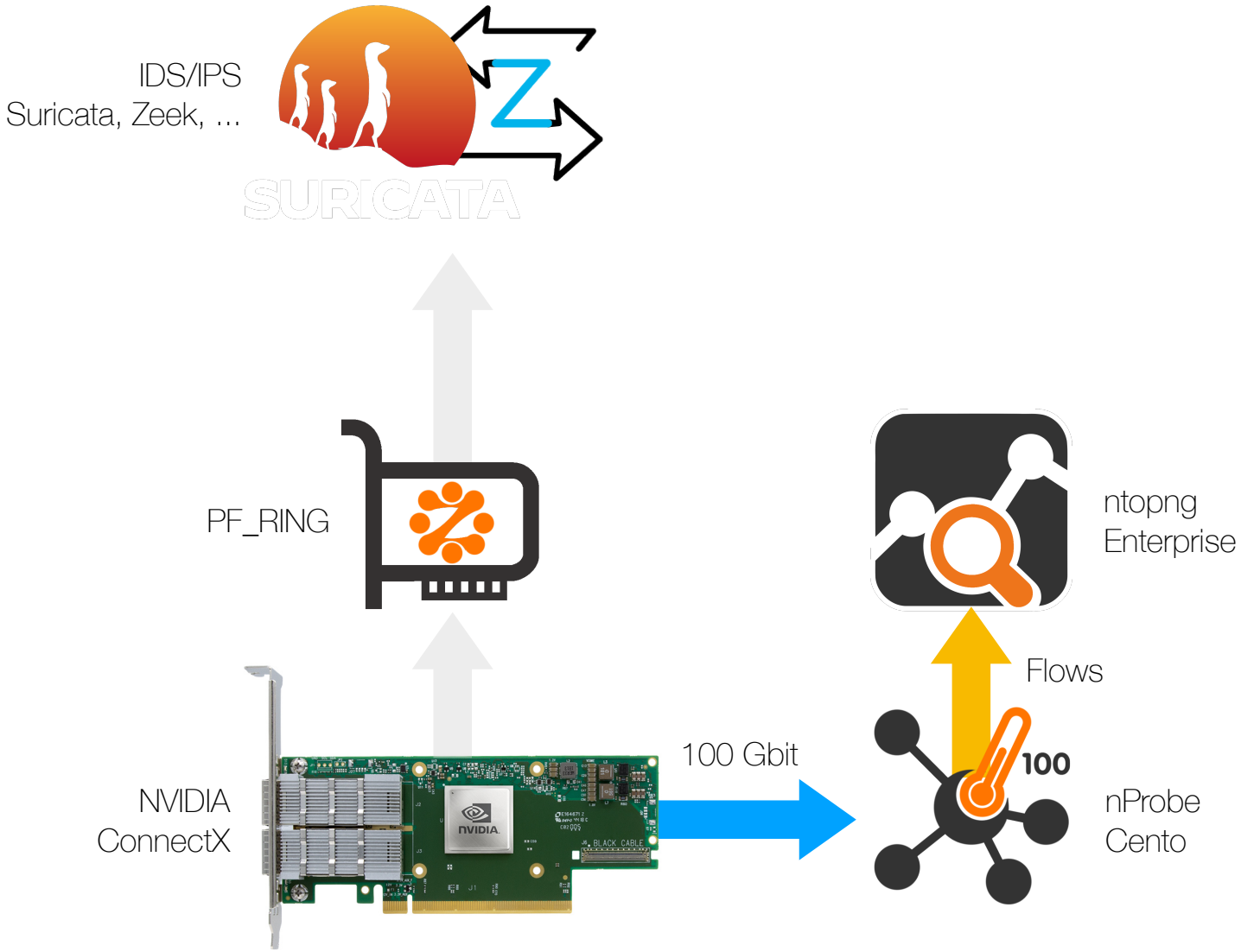

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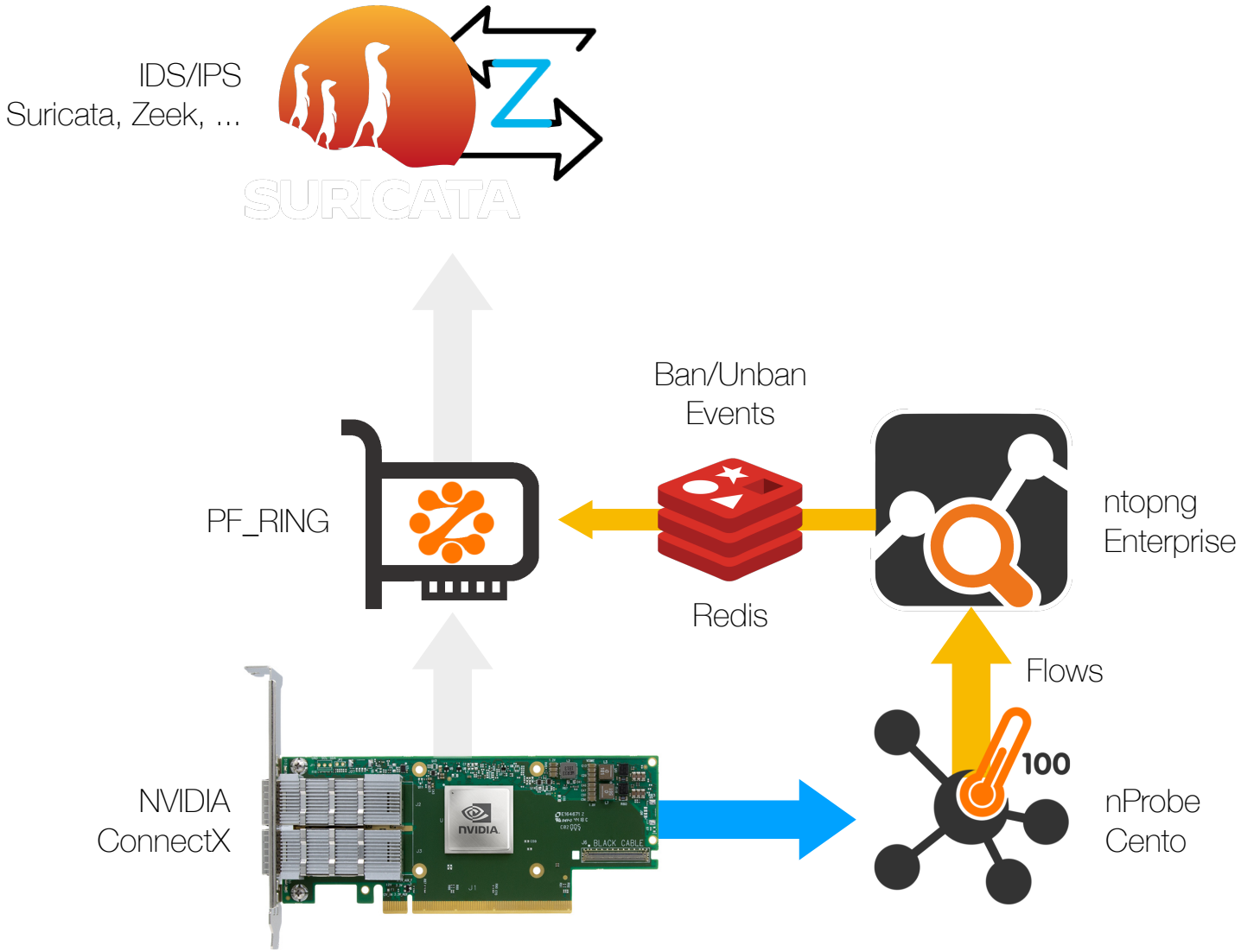

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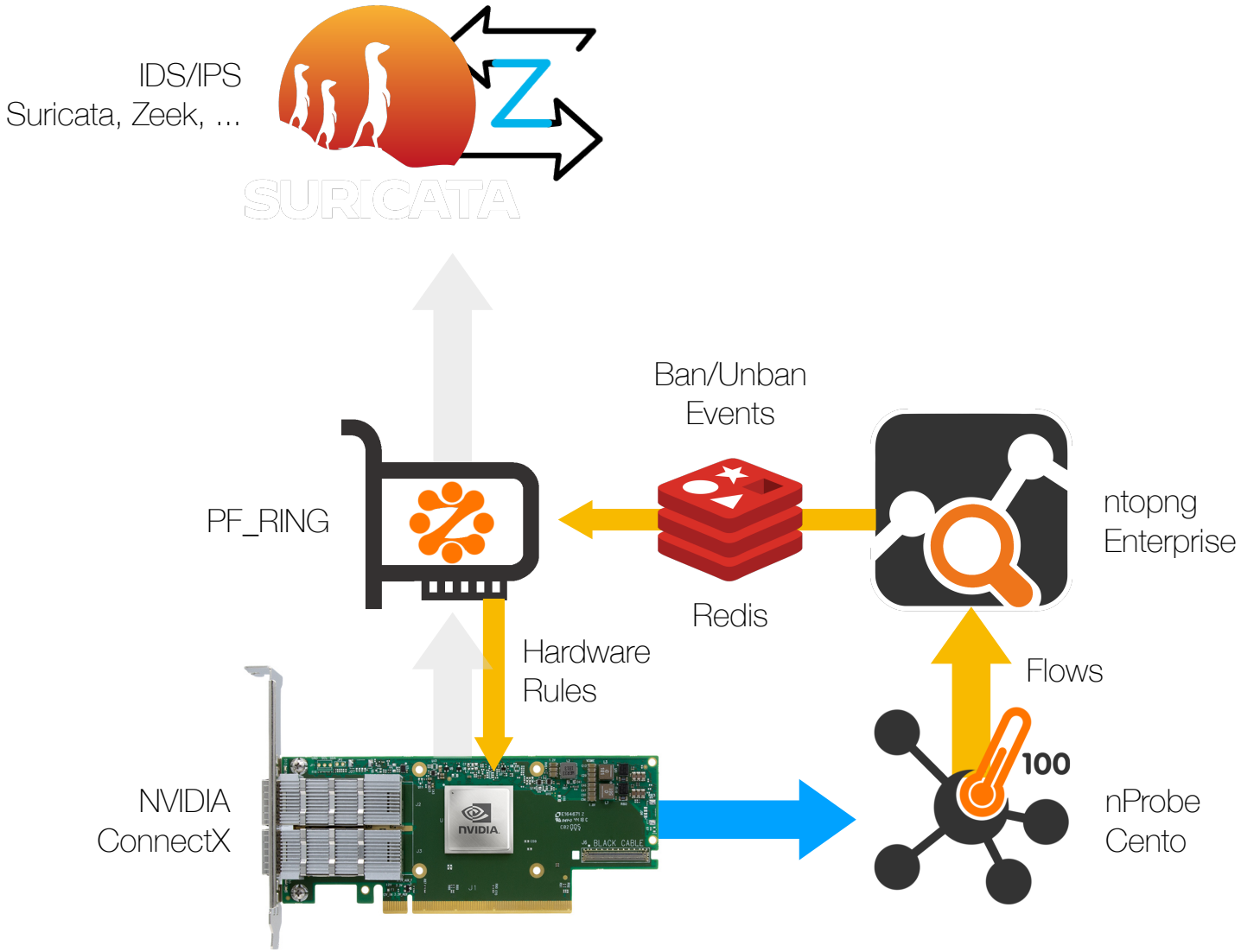
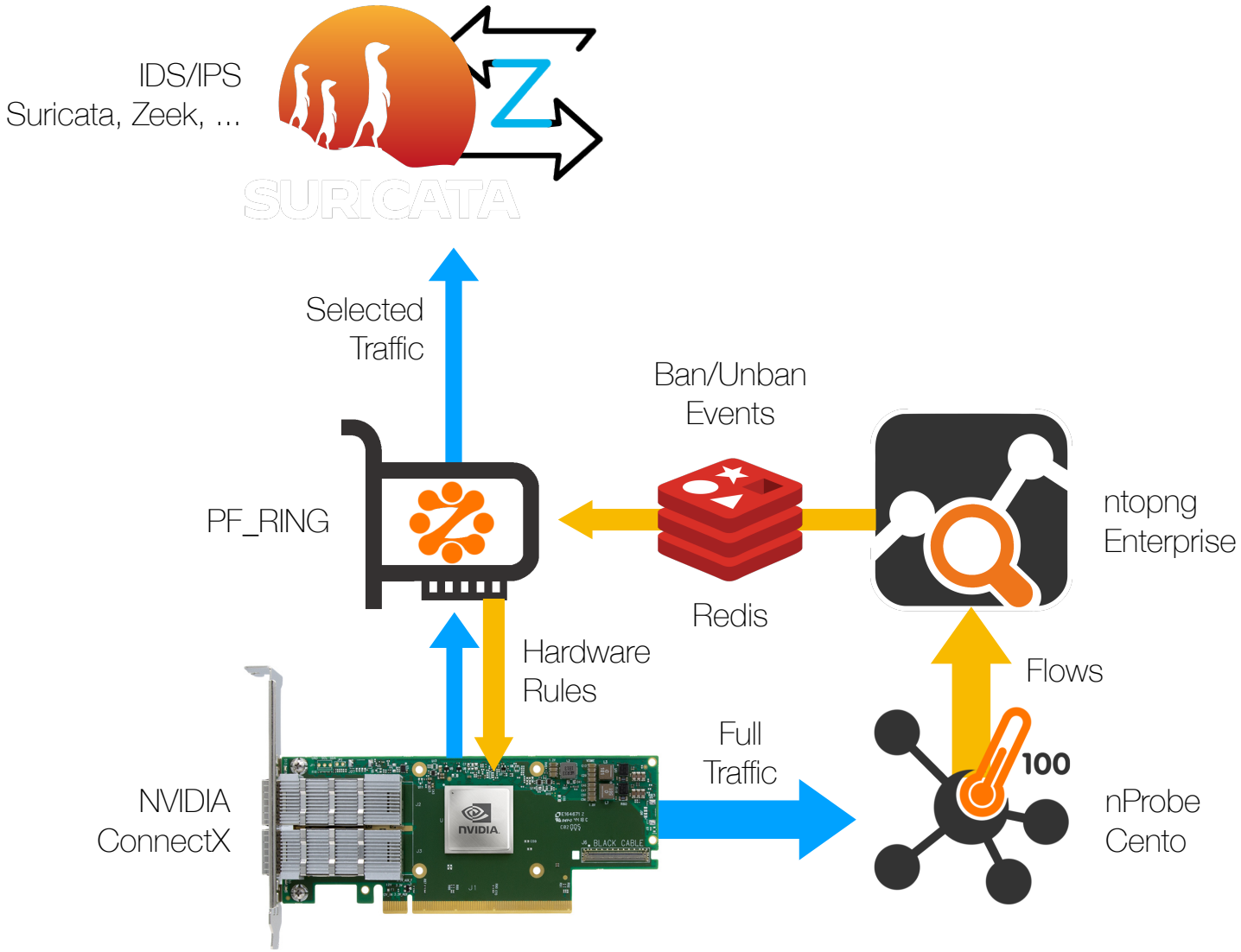
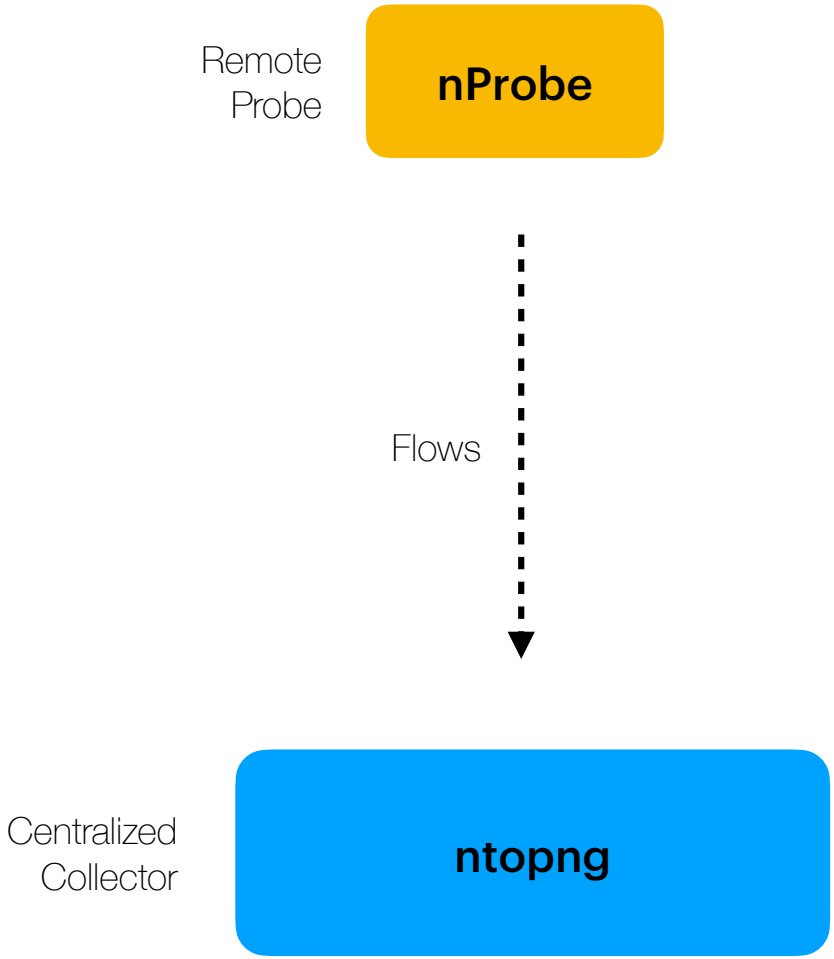


Suricata and Zeek On Demand

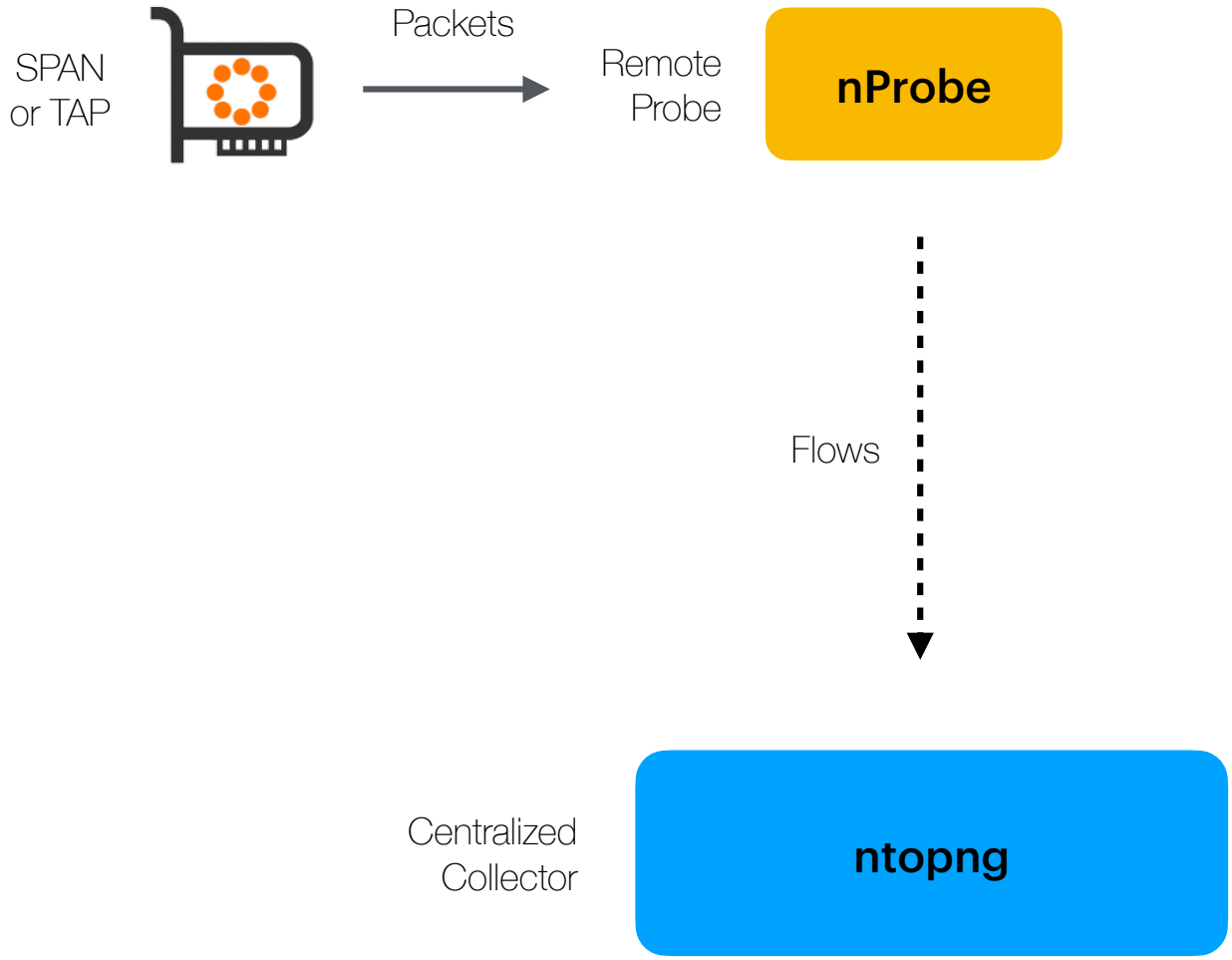


Cloud License

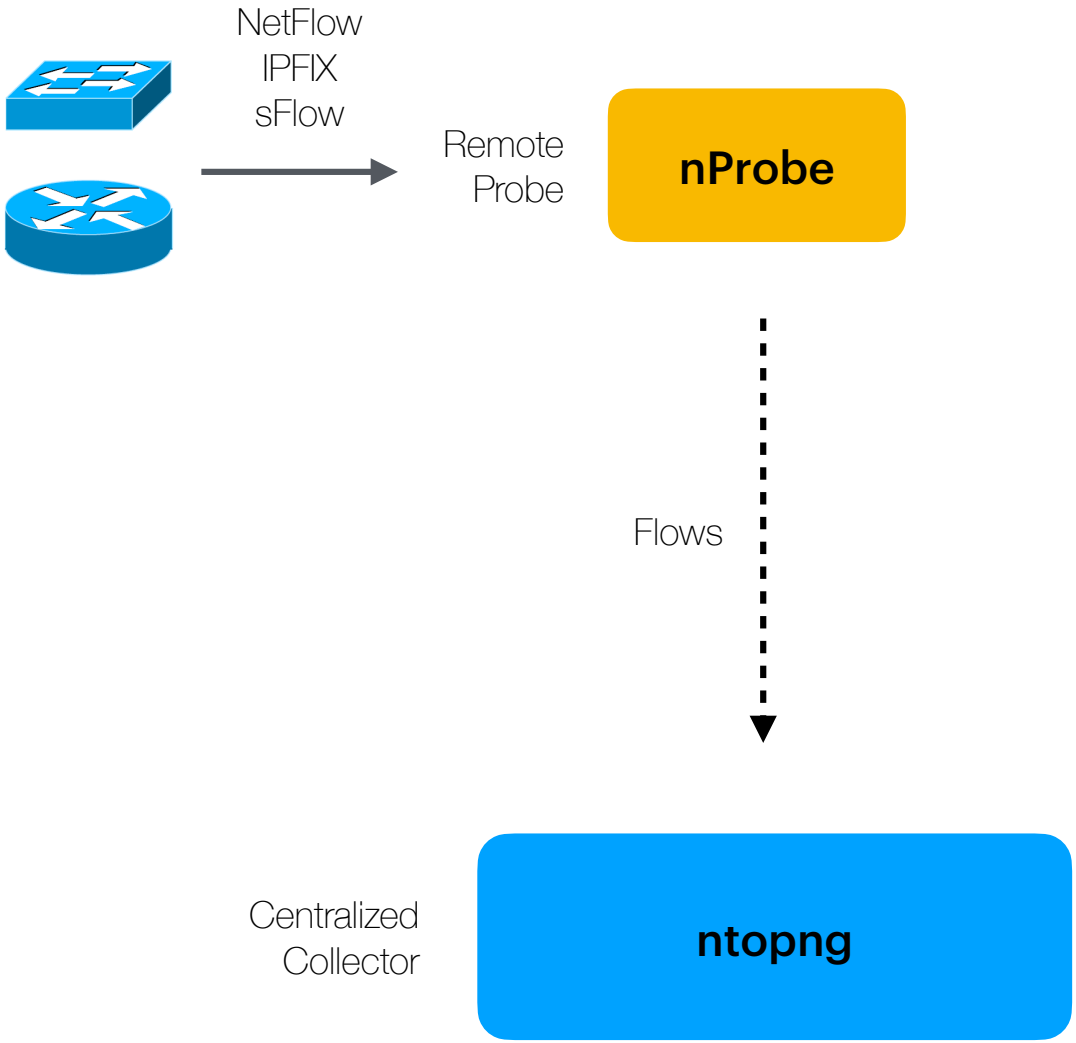
Remote Traffic Analysis



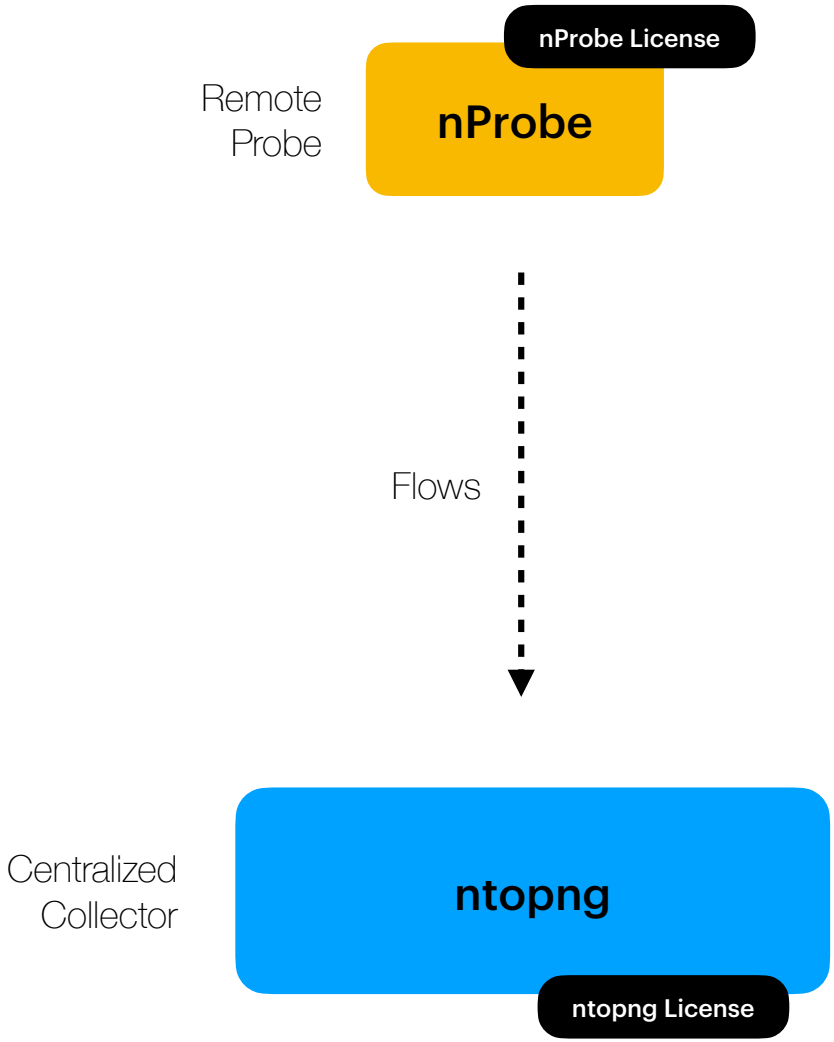
Remote Traffic Analysis



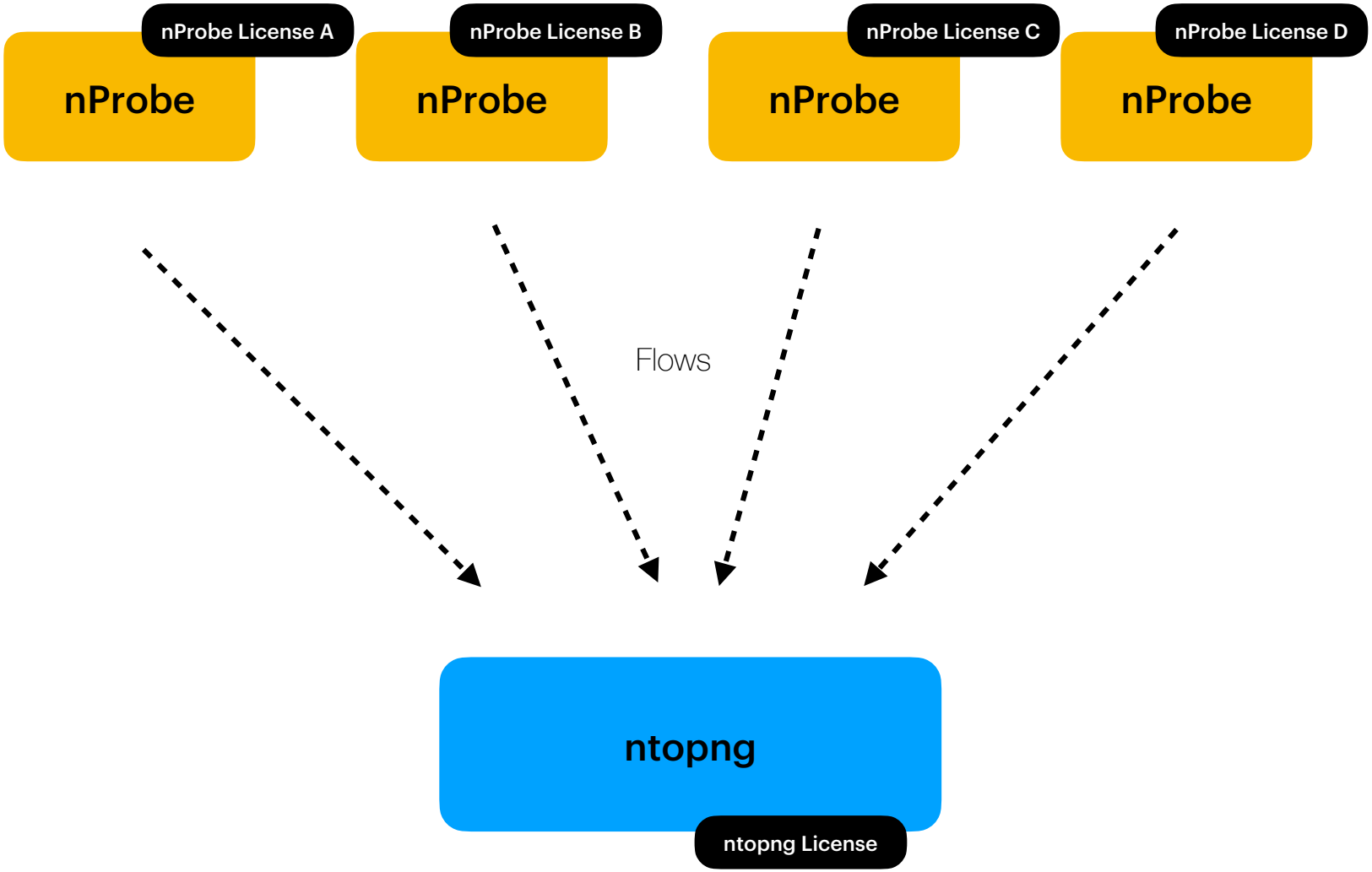
Remote Traffic Analysis



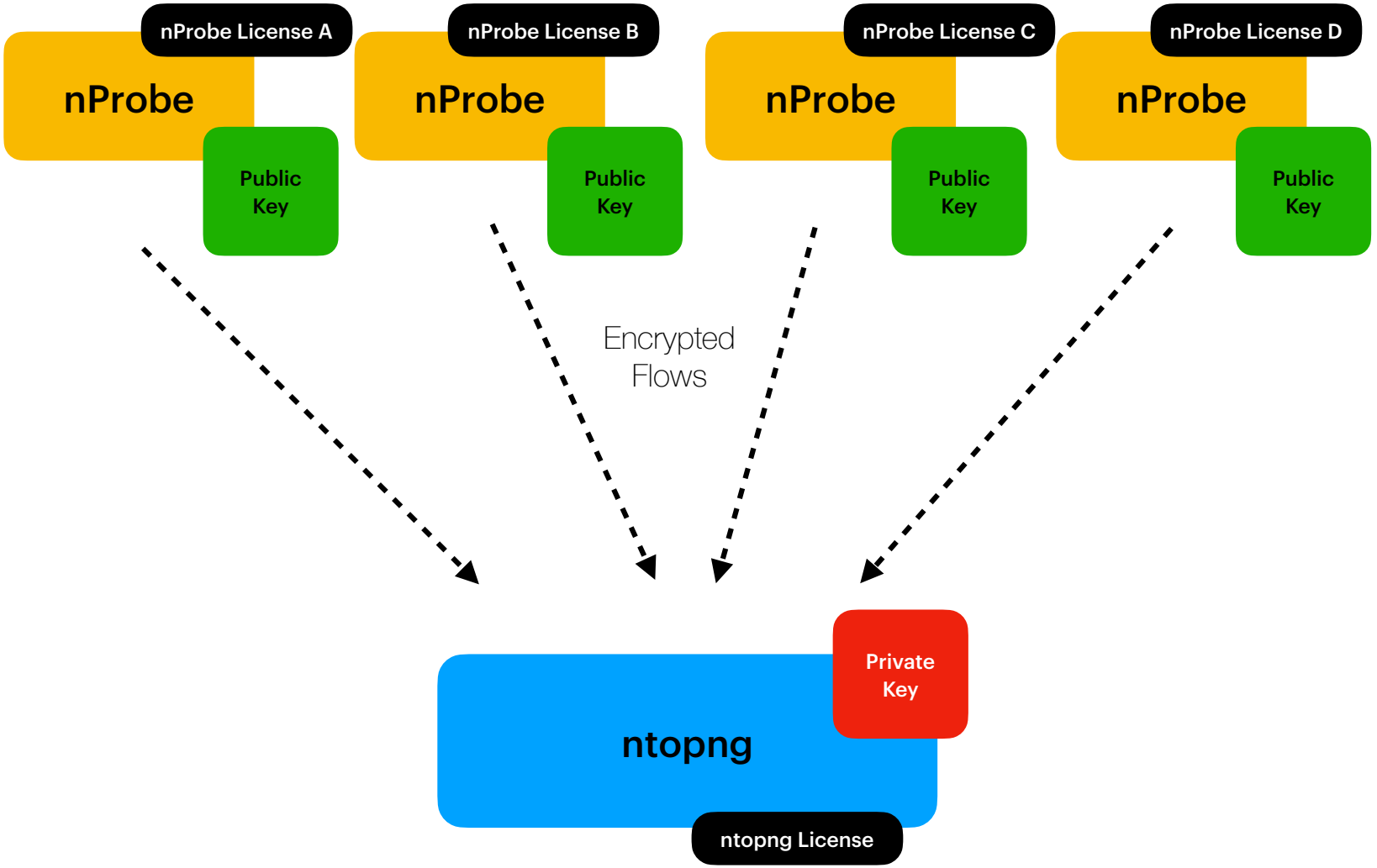
Remote Traffic Analysis



With Many Probes

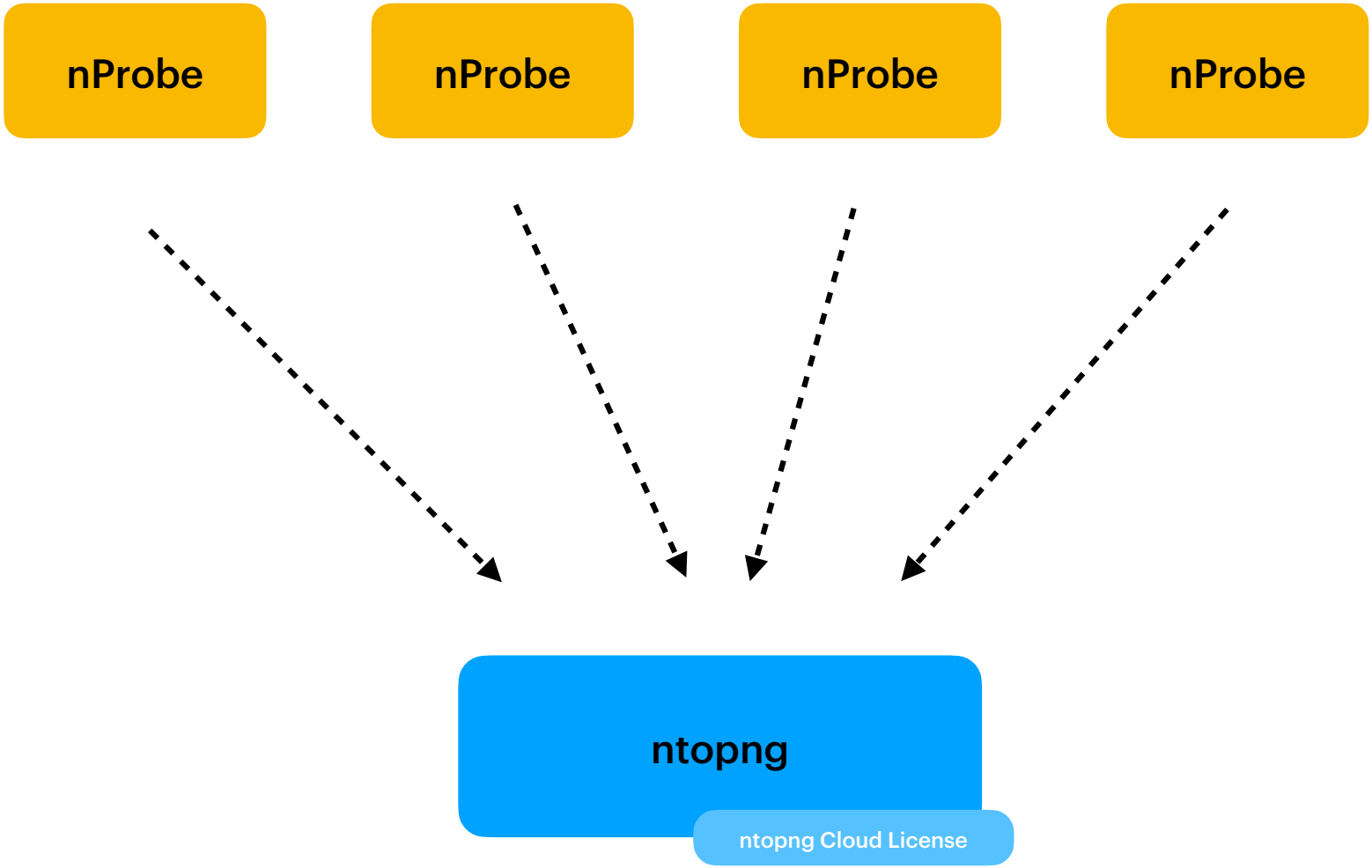


With (Optional) Encryption



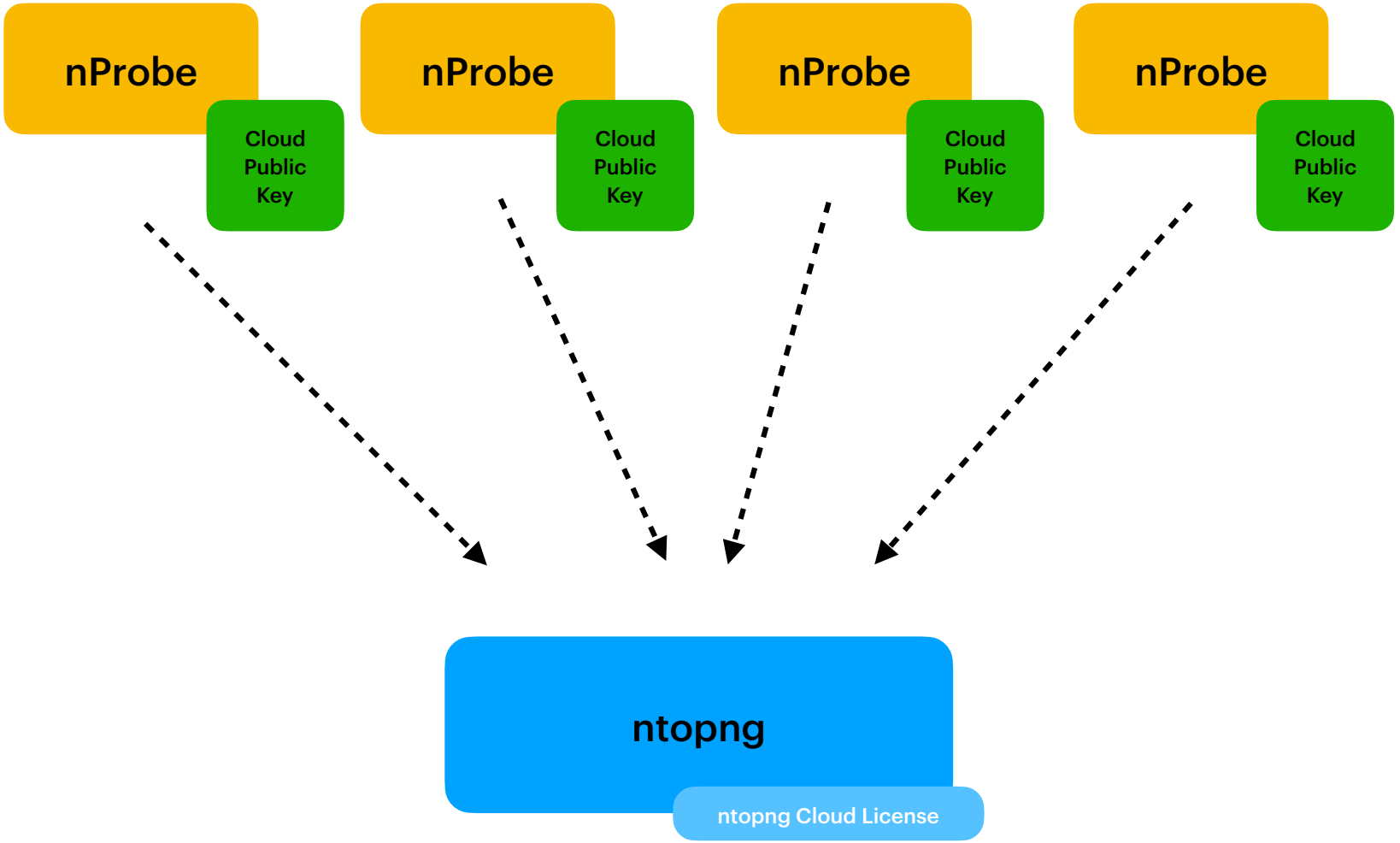
Cloud License

No per-probe license key required



Cloud License

Secure (Encrypted Export) by design



Bundle vs Cloud License

- Bundle
  - single key unlocking ntopng, nProbe, n2disk (they must run on the same box)
- Cloud
  - automatically unlocks remote nProbe instances
  - Designed for Service Providers
    - License the on-Cloud box and forget about System IDs on the probe side (just distribute the public key)
  - Anyone interested in early adoption? Contact us!

NTOPCONF '23

SEPTEMBER 21 (TRAINING)-22 (CONFERENCE), 2023

Submission Deadline

JUNE 30TH, 2023