

Cubro Sessionmaster EX 48

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The Sessionmaster EX 48 is a state of the art Network Packet Broker based on the latest NPU technology. To aggregates, filter and load balance network traffic to sent to network monitoring, security and management tools. Sessiomaster EX 48 allows you to filter and load-balance traffic from layer 1 - 7.

We support 1 Mio filter rules, and a filter change rate up to 5000 per second. Best figure in Industry !

Extended Function:

On box capturer: The unit is equipped with two high performance NPU's and an Intel Core 7i processor this gives us the ability to capture on the box it selves.

Advanced layer 7 filtering: This feature with the possibility to use 1 Million rules and the extreme fast rule change rate, we the possibility to solve most any request for advanced filtering.

Application:

- Load balancing in all OSI layers
- Filter traffic based on Layer 5 and up messages
- Deterministic packet switching (for video applications)
- SDN switch (open-flow 1.3 support)

No additional software costs, all applications included in the unit

Functions

Link/Port Aggregation

Aggregation many to any, and any to many at all link speeds

10 Gbps traffic demultiplexer

If highly loaded 10 Gbps links have to be monitored the traffic can be easily demultiplexed into 24 low traffic Gbps links.

Jumbo Frame Support

The Packetmaster supports jumbo Ethernet frames with a size of up to 12000 Bytes.

Support of IPv4 and IPv6.

Ports

- 24 x 10 Gbps / 1 Gbps
- 24 x 1 Gbps
- 1 x 10/100/1000 Base-T (Management)
- 1 x RS232 Console

Configuration / Communication

Telnet and SSH

Bandwidth

250 Gbps backplane

Aggregation latency

Average 1 μ s for 64-byte frames

MTBF

198,185 hours

Rugged 19" Housing

The Sessionmaster is delivered in a rugged 19" 1U housing with precise connector labeling on the front panel.

Different Power Versions

48 VDC or 230 VAC in single and dual power supply versions available.

Operating Temperature

0 to 45°C

Operating Humidity

90% maximum relative humidity

Dimension

W=435.00 mm, L=393.70 mm, H=42.80 mm

The Cubro Sessionmaster EX24 is a reliable Network Packet Broker. Designed for high speed and lossless packet handling.



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www.cubro.net

General Functions

Aggregation: Traffic aggregation from many input ports to one or many output ports. This works also with different link speed up to 40 Gbps.

Filtering: 1 Million flow rules (filters) can be set in the unit. The rules setup rate is 5000 per second. Filtering is possible on any byte in the packet included data plane.

Available actions functions after a positive match are:

Send out: to one or more ports - even the same as the input is possible.

Drop: delete the specific packet

Modify: modify specific fields in the matched packets, VLAN, MPLS, MAC SRC, MAC DST, PORT, VLAN Priority and some more.

Add VLAN: The unit can tag a VLAN on the input to separate the traffic after aggregation

Strip VLAN: VLAN can be removed, Q in Q is supported

Add MPLS: Add an MPLS tag to a matched packet

Strip MPLS: Remove an MPLS tag from a matched packet

Stacking of rules: this function gives the option to generate very complex filter rules.

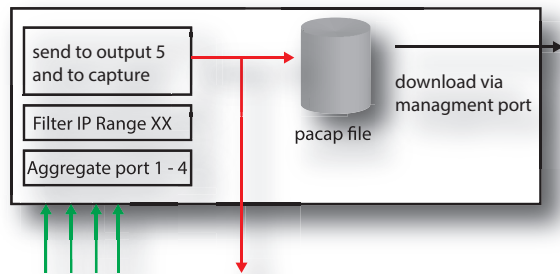
Lifetime of rules: Rules can be set with a live time counter, if the counter becomes 0 the rule will be removed automatically

GRE Tunnel support: The device can work as end device for a GRE tunnel, for back hauling applications.

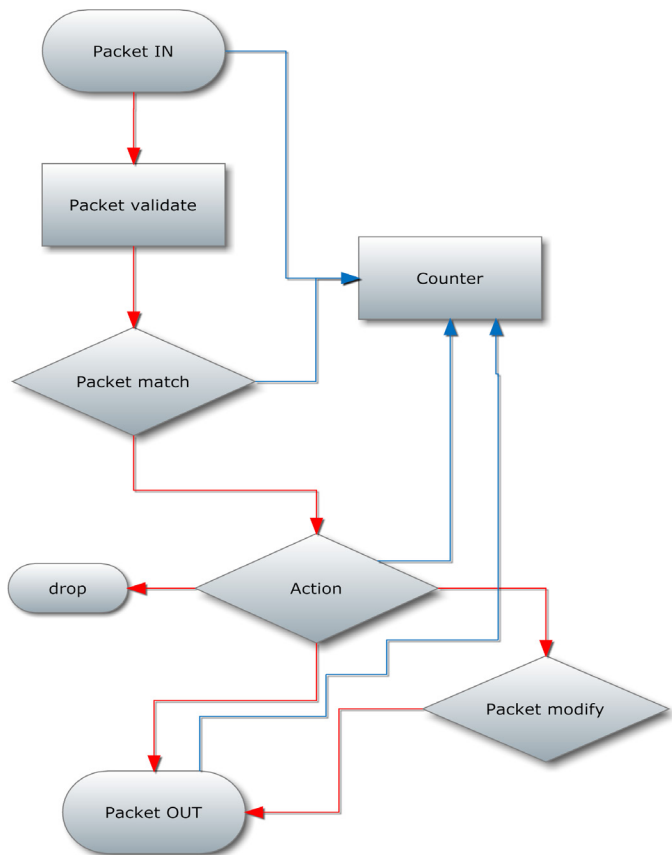
VXLAN Tunnel support: The device can work as end device for a VXLAN tunnel, for back hauling applications.

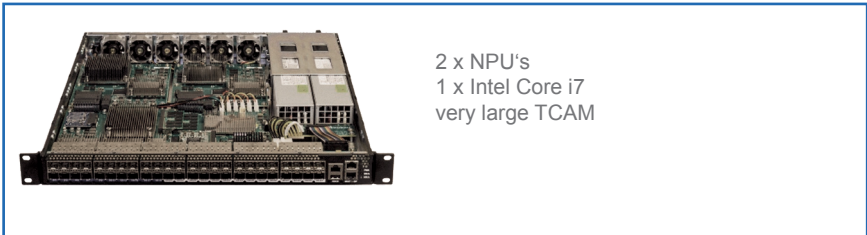
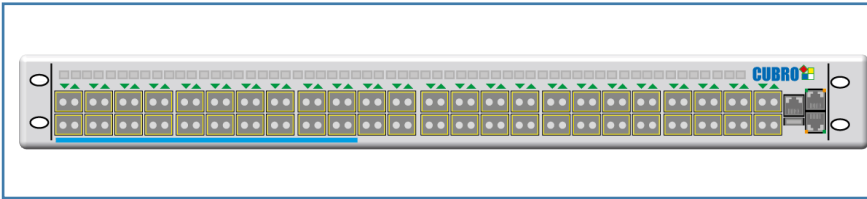
Load balancing: up to layer 7

On box Capture up to 2 Gbit load:



Packet flow inside the Sessionmaster:





Inputs*

20 x 10 Gbps full duplex
24 x 1 Gbps full duplex
SFP Ports for any kind of SFP/SFP+

* Each port can be input and / or output depending on the application and configuration

Outputs*

20 x 10 Gbps full duplex
24 x 1 Gbps full duplex
SFP Ports for any kind of SFP/SFP+

* Each port can be input and / or output depending on the application and configuration

Performance

Performance up to 250 Gbps

Boot time from power on to working 180 sec.

Packet delay through processing less than 1 μ s

Management

Management Port: (1) RJ45 10/100 Mbit
Configuration (CLI) Port: (1) RS-232 DB9

Indicators

Per RJ45 port: Speed, Link/ Activity
Per SFP+ port: Status, Rx, Tx, Link
Per device: Power, Status

Operating Specifications

Operating Temperature: 0°C to 40°C
Storage Temperature: -10°C to 70°C
Relative Humidity: 10% min, 95% max,
Non-condensing

Mechanical Specifications:

Dimensions (H x W x D): 42.8 x 435 x 393.7 mm
Weight : 9.4 kg

Electrical Specifications:

Input Power: 100-240V, 2A, 47-63Hz
DC Input: -48VDC nominal. -36 to -72VDC, 10A
DC Receptacle: Terminal peak, 12-14 gauge wire
Maximum power consumption: 350W

Certifications

Fully RoHS compliant
CE compliant
Safety:
UL 60950-1 / CSA C22.2 60950-1-07 / IEC 60950-1 (2005)
EN 60950-1 (2006)

GTP load balancing / GTP DPI filtering

Today the major load in mobile networks is on the GN interface, the connection between SGSN and GGSN, and on LTE networks on the S1-U interface between eNodeB and IP Gateway. These interfaces hold signaling information as well as all the user plane IP traffic.

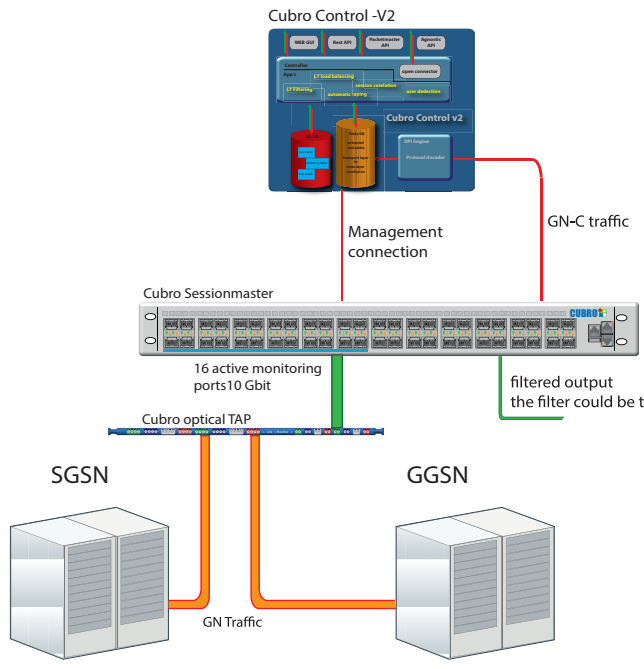
Even on smaller networks you can expect multi GB traffic on these interfaces. This amount of traffic is difficult and expensive to monitor and to analyze. With the roll out of LTE as access technology under the aspect of ADSL/ VDSL replacement the load will grow exponentially and 40 Gig or 100 Gig links will be seen soon.

40 Gig or 100 Gig links could not be monitored by single probes and 10 G full loaded links are also a challenge for existing probes, and in any case it is an expensive issue.

The solution could be

- 1.) monitor only specific customers.
- 2.) to spread / load balance the traffic to several probes
- 3.) remove parts of the traffic (relevant / not relevant)

Monitor only specific customers.



All these three options are not easy to achieve because the relevant protocol transporting this traffic is GTP "GPRS TUNNEL PROTOCOL". The stack is rather complex:

Signaling: MAC/IP/UDP/GTP/SCTP/SIGNALING PLANE

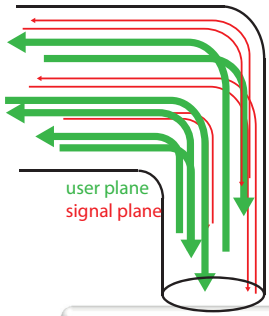
User plane: MAC/IP/UDP/GTP/IP/USER PLANE the user plane holds another fully independent IPV4 or IPV6 stack.

The second challenge is that each user can initiate more than one tunnel, to make the tool useful it is also necessary to identify each mobile and forward all tunnels related to one mobile to the probe to produce a useful call trace.

That means the entire load balancing and filtering must work in layer 6 and up. A classical filter tap will not work on these protocols because the GTP protocol is organized in 4 tunnels to transport the information, two for the signaling up/down and 2 for the user plane up/down.

For a useful decoding it is vital to capture all 4 tunnels with one probe. The only way to identify the correct tunnels is to look in the GTP tunnels and find the TEID "TUNNEL END POINT IDENTIFIER". The TEID helps you to find the relevant tunnels in several 100.000 simultaneous tunnels.

Appnote GTP load balancing (universal load balancing for higher layers)

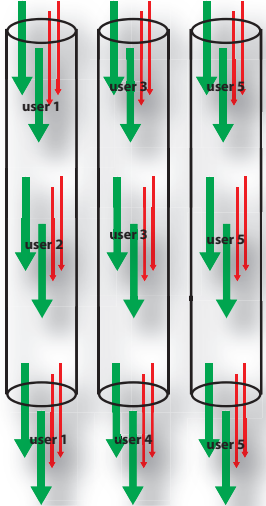
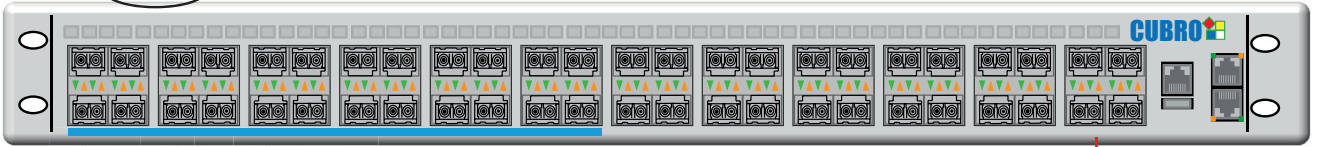


GTP Session
each session consists of 4 streams two users streams and two signaling streams the identifier of the stream is a field called TEID (tunnel endpoint ID)

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Frame 1: 94 bytes on wire (752 bits), 94 bytes captured (752 bits)
Ethernet II, Src: 3com_03:04:7c (00:01:02:03:04:7c), Dst: Cisco_56:00:c0 (00:26:0b:56:00:c0)
Internet Protocol Version 4, Src: 213.94.91.77 (213.94.91.77), Dst: 213.94.86.141 (213.94.86.141)
User Datagram Protocol, Src Port: gtp-user (2152), Dst Port: gtp-user (2152)
GPRS Tunneling Protocol
  Flags: 0x32
  Message Type: T-PDU (0xff)
  Length: 44
  TEID: 0x00440db8
  Sequence number: 0x8a01
  T-PDU Data 40 bytes
Internet Protocol Version 4, Src: 88.249.215.33 (88.249.215.33)
Transmission Control Protocol, Src Port: 28347 (28347), Dst Port:
  
```

Sessionmaster 48
1 Mio rules
2000 rules per sec change
offset filtering



The traffic is now separated and each of the four streams of one user is now sent to one specific output, even when the customer is moving (changing cell) his traffic stays on the specified port.

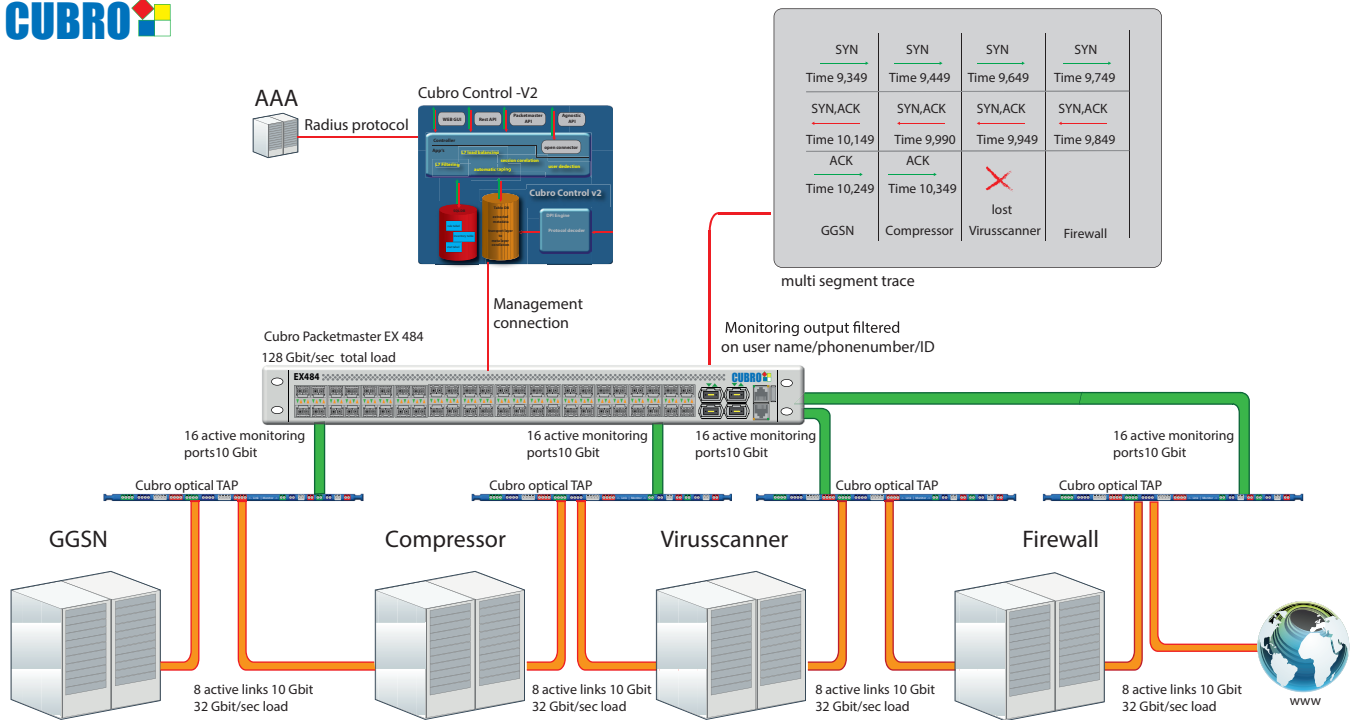
Cubro Control -V2
The Cubro Control application gets all the signaling messages, decodes the messages and send then the steering rule back to Packetmaster, the steering can be based on the TEID or on the customers IP address or any other flag. If Cubro control has access to the radius messages from the AAA the steering can be done by MSISDN as well

! GTP sessions can stay very long open day, or weeks this could be a problem because too many sessions could be open, but not in our case if an open session is inactive for a certain time the Session master delete the session but Cubro Control holds still the session information. In the case that the deleted session becomes active again Cubro Control sends a new rule to the Packetmaster and the traffic stays on the same output port.

Cubro Control V2 is capable to control several Sessionmasters, but it could also control Packtemaster EX units if the amount of flows is lower.

This load balancing concept works for all protocols, for example SIP (call id), or MAP (global title) and much more (give us a call if you have specific request.)





Customer Project Packet core GI smart monitoring

To lower the cost but still give a full troubleshooting solution for high loaded GI links Cubro invented this application for a well known European Mobil operator.

The customer has 32 Gbit/sec GI traffic. This traffic pass 4 network elements on his way to the Internet. The GGSN, and Compressor, the Virus-scanner and finally the Firewall. These network elements are connected over 8 multi mode 10 Gbit links.

The challenge in this project was a lot of 10 Gbit links (32 in total and a lot of traffic 4 x 32 Gbit/sec) The customer wants to have access to the traffic of each link, and capture all the data. During the discussion with the customer and testing several capture solutions it turns out that capturing all the traffic is not really a solution.

- 1.) The cost of a solution to capture 128 Gbit/sec and store it for two weeks is very expensive
- 2.) The time to retrieve the date from one customer is very long
- 3.) Unclear legal situation is it allowed to capture all without a real need because 99.9 % of the traffic is not needed for troubleshooting

Then Cubro came up with the idea of a customer based filtering. This solution can be done with the Cubro Packetmaster which is anyway need and the Cubro Control V2 Application

How it works!

a.) We place Cubro optical slim Taps between all network elements. Then we connect the monitoring ports (64 ports 10 Gbit) to the Packetmaster EX484-2 or Sessionmaster this unit can handle 64 10 Gbit ports. Another special feature of this unit is that we can use the optical inputs and outputs separated this gives us the option to have still monitoring output.

b.) We also capture and analyze the traffic which is coming from the AAA, in this case radius, Cubro control builds a database out of this traffic, and this database is constantly updated. The database holds all information's to filter a specific customer out of this big data pipe. This traffic is in general small enough to capture it with any tool even a laptop with Wireshark. It possible to set up to 2000 filters *, and network engineer can also select which segment he wants to see.

* If you use the Sessionmaster you can use up to 1 Million filters.

