

# Functions

## Link/Port Aggregation

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

## 40 Gbps traffic demultiplexer

If highly loaded 40 Gbps links have to be monitored the traffic can be easily demultiplexed into 48 low traffic 10 Gbps links.

## Jumbo Frame Support

The Packetmaster supports jumbo Ethernet frames with a size of up to 16000 Bytes.

## Support of IPv4 and IPv6.

### Ports

32 x 10 Gbps/1 Gbps and  
2 x QSFP 40 Gbps (EX32+)

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

### Configuration / Communication

Web, Telnet and SSH

### Bandwidth

1.2 Tbps backplane  
1700 million Packets per sec

### Aggregation latency

Average < 1  $\mu$ s for 64-byte frames

### MTBF

184,125 hours

### Rugged 19" Housing

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

### Different Power Versions

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 Packetmaster EX32(+) is a reliable Network Packet Broker. Designed for high speed and lossless packet handling.**

# Cubro Packetmaster EX 32 (+)



The Packetmaster EX 32(+) is the newest high performance Network Packet Broker that aggregates, filters, load balances and generally steers the traffic based on 64000 possible rules.

Network traffic can be sent to network monitoring, security and management tools. Packetmaster EX 32(+) allows you to filter and load-balance traffic from a 10 or 40-Gbps link to multiple 1-Gbps monitoring tools or aggregate multiple 1 Gbps links to 10 or 40-Gbps monitoring tools.

Packetmaster EX32(+) also supports traffic modification as well as changing, removing and adding VLAN, MPLS, VXLAN, NVGRE, MLA, GENEVE

**No additional software costs all applications included in the unit price.**

## Extended Functions:

The management host controller of every EX unit runs a fully featured Debian Linux as operating system. On this host script languages like Python, Perl, TCL, or simple Linux shells are available to run 3rd party applications to extend the function of the Packetmaster. These applications can be developed by Cubro or the customer.



A perl script collects counters and writes these counters in an external SQL Database for later analysis.



A python script reads files from a server and sets filters based on this changing data.

A python script changes the filters based on link load information from an other packetmaster.



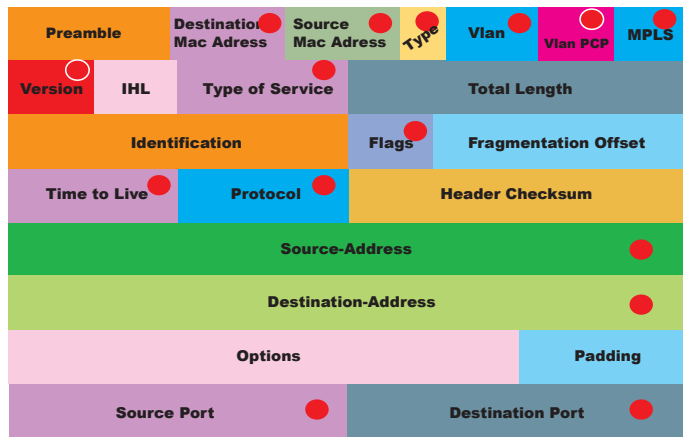
A shell script pings different devices and changes filter rules based on ping response.



# General Functions

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

**Filtering:** 64000 flow rules (filters) can be set in the unit.



The red dot marked fields can be used as a match for a packet, stand-alone, combined or with wild cards. For IP Src and IP Dst super nets are supported.

**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.

**Generate nFLOWS and sFLOWS CDRS:**

The EX32(+) can send standard nFlow or sFlow CDRS to a collector devices to monitor the traffic processed by the EX 32(+). These devices can produce graphs and SNMP traps for northbound signalization.

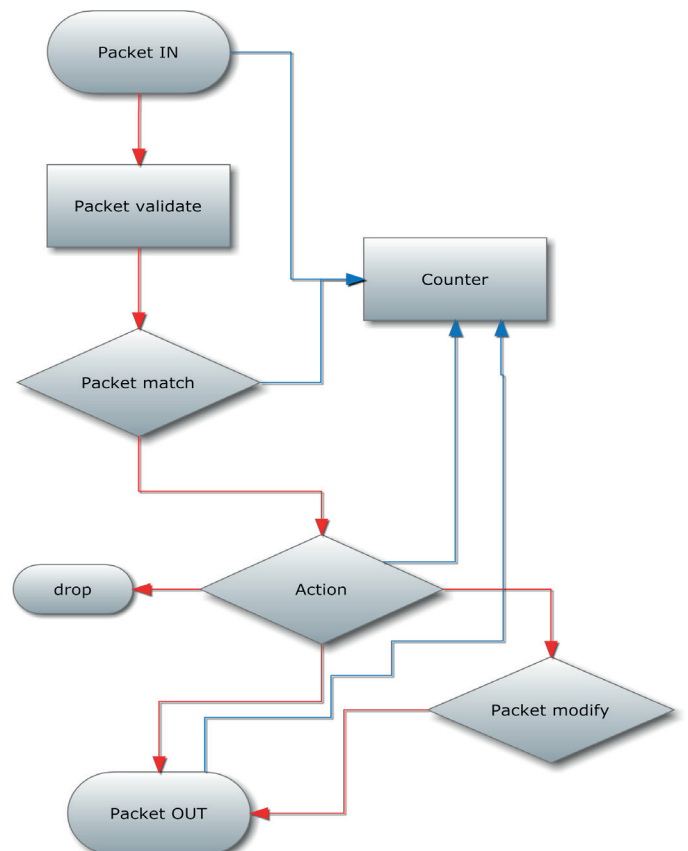
**GRE Tunnel support:** The device can work as end device for a GRE tunnel, for back hauling applications.

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

**Load balancing:** L2 / L3 hash based load balancing, up to 10 load balancing groups.

**AAA Radius support:** user identification

**Stacking of units:** one Packetmaster can control several other Packetmasters. This gives the possibility to extend the amount of ports per unit.



# Technical Data

32 x 10 Gbps 2 x 40 Gbps NPB



Rule Name	Priority	Source	Port	Protocol	VLAN	MAC Src	MAC Dst	IP Src	IP Dst	Port Src	Port Dst	ICMP Type	ICMP Code	Actions	Packets	Bytes	Duration	Table	TCPM Flow
H.R_L_2	32768		1-4	ip				117.10.10.25	20.20.20.20					output 6	0	0	54278.5486	0	4
H.R_L_1	32768		1-4	ip										output 6	0	0	54483.2676	0	4
M.G.W_1	32768		1-4	udp				10.10.10.10		UDP 1608				output 5-6	0	0	69614.6556	0	4
M.G.W_2	32768		1-4	udp				10.10.15.15		UDP 1608				output 5-6	0	0	69634.5056	0	4
D.P.L_1	50000		1-4	udp				10.10.17.17		UDP 601				output 5-6	0	0	542825.0526	0	4
D.P.L_2	50000		1-4	udp				10.10.17.18		UDP 601				output 5-6	0	0	269813.5225	0	4
	32768													drop	0	0	1948.016	0	1
D.P.L_1	32768		1-4		101									output 6	0	0	543849.4346	0	4
M.G.W_3	32768		1-4		33									drop	0	0	534567.7356	0	4
G.G.S.N_1_S.P	32768		2-3		123-129									output 6	0	0	543838.2596	0	10
G.G.S.N_1_S.P	32768		3		601-604									output 2	0	0	543842.7386	0	4
D.P.L_2	32768		1-4	ip				15.15.15.15						output 5	0	0	542326.0396	0	4
P.r.o.x.y.1	40000		1-4	udp						UDP 80				drop	0	0	696266.4656	0	4
P.r.o.x.y.1	40000		1-4	tcp						TCP 80				drop	0	0	696237.5766	0	4
P.r.o.x.y.1	32768		1-4	tcp						TCP 80				drop	0	0	696027.9146	0	4

**Inputs\***

32 x 10/1 Gbps full duplex  
2 x 40 Gbps QSFP (+ version)

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

**Outputs\***

32 x 10/1 Gbps full duplex  
2 x 40 Gbps QSFP (+ version)

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

**Performance**

Performance up to 1200 Gbps 1.2 Tb  
1700 million packets/sec  
Non blocking design  
Boot time from power on to working 180 sec.  
Packet delay through processing less than 1 μs

**Management**

Management Port: (1) RJ45 10/100/1000 Mbit Configuration (CLI) Port: (1) RS-232 DB9  
USB for software update

**Indicators**

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

Dimension (HxWxD): 42.8 x 435 x 393.7 mm  
Weight : 7.2 kg

Airflow: Front -Back

## Electrical Specifications:

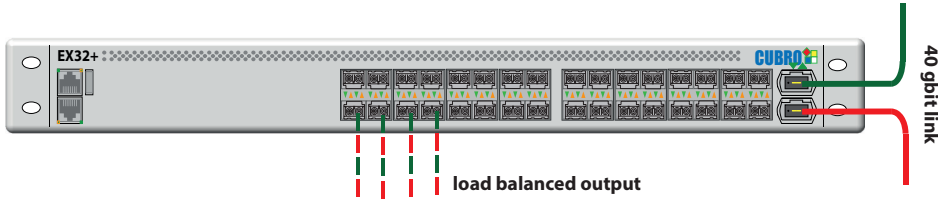
Input Power: 100-240V, 2A, 47-63Hz  
Maximum power consumption: 170W

## Certifications

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

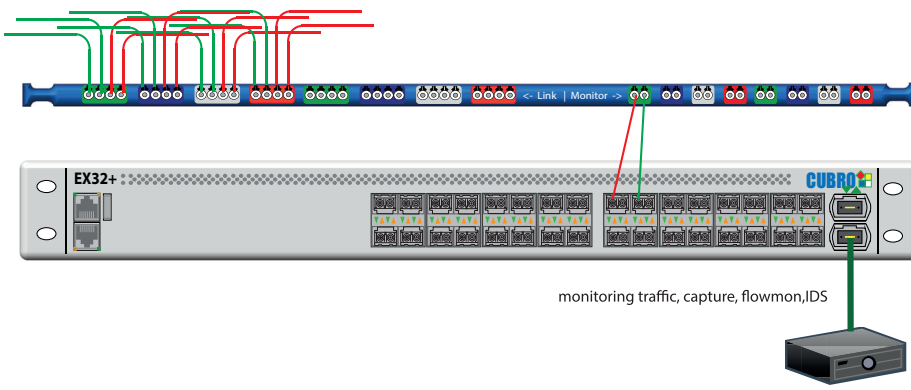


## App: 40 Gbit load balancing



The EX 32+ is connected inline to a 40 Gbit live link. Using the load balancing capability of the Packetmaster EX 32+, to load balance the 50 Gbit traffic to several 10 Gbit ports.

## App: 10 Gbit aggregation



The EX 32 is connected via the Cubro optical TAP to a 10 Gbit live link.

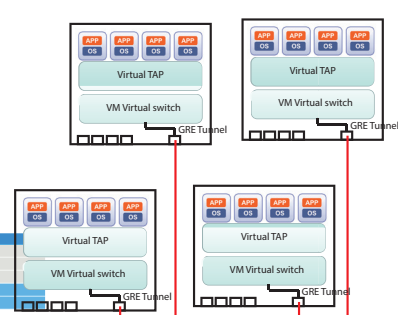
The aggregation feature combines the traffic of up to 16 x 10 Gbit links to two 40 Gbit outputs for monitoring purposes. Using the filtering capability of the Packetmaster EX 32, the user can select only the portion of the traffic which is needed to solve the network problem.

## App: GRE decapsulation in hardware up to 10 Gbit linespeed

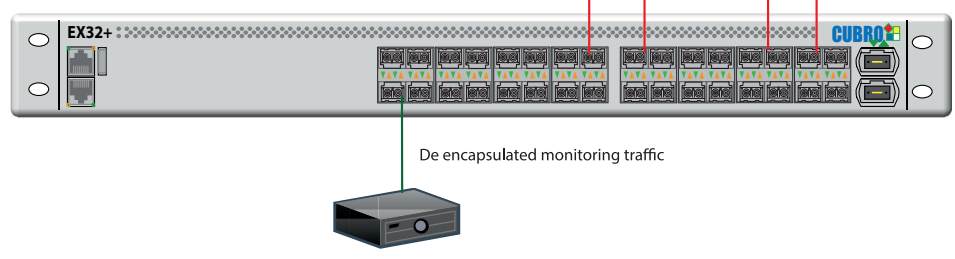
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Before GRE de encapsulation
Frame 1698: 604 bytes on wire (4832 bits), 604 bytes captured (4832 bits) on interface 0
Ethernet II, Src: Vmware_63:23:42 (00:50:56:63:23:42), Dst: CentecNe_0a:10:16 (00:1e:08:0a:10:16)
Internet Protocol Version 4, Src: 172.17.1.1 (172.17.1.1), Dst: 172.17.1.2 (172.17.1.2)
Generic Routing Encapsulation (Transparent Ethernet bridging)
Ethernet II, Src: IntelCor_5b:b0:9c (60:67:20:5b:b0:9c), Dst: Vmware_aa:c0:d3 (00:50:56:aa:c0:d3)
Internet Protocol Version 4, Src: 172.16.100.61 (172.16.100.61), Dst: 172.16.101.220 (172.16.101.220)
Transmission Control Protocol, Src Port: 64008 (64008), Dst Port: 80 (80), Seq: 3827, Ack: 68616, Len: 500
Hypertext Transfer Protocol
GET /modules/imageframe/frames/flicking/BR.gif HTTP/1.1\r\n
[Expert Info (Chat/Sequence): GET /modules/imageframe/frames/flicking/BR.gif HTTP/1.1\r\n]
Request Method: GET
Request URI: /modules/imageframe/frames/flicking/BR.gif
Request Version: HTTP/1.1
Host: album.creneco.com\r\n
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0\r\n
Accept: image/png, image/*;q=0.8,*/*;q=0.5\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Referer: http://album.creneco.com/main.php?g2_view=imageframe.css&g2_frames=none%7Cshadow%7Cflicking\r\n
Cookie: GALLERYSID=78cb78dbabb51f330677f4a72c4f22b9\r\n

After GRE de encapsulation
Frame 7508: 566 bytes on wire (4528 bits), 566 bytes captured (4528 bits) on interface 0
Ethernet II, Src: Cisco_73:7e:c2 (00:17:94:73:7e:c2), Dst: Vmware_aa:c0:d3 (00:50:56:aa:c0:d3)
Internet Protocol Version 4, Src: 172.16.100.61 (172.16.100.61), Dst: 172.16.101.220 (172.16.101.220)
Transmission Control Protocol, Src Port: 64325 (64325), Dst Port: 80 (80), Seq: 4686, Ack: 100998, Len: 500
Hypertext Transfer Protocol
GET /modules/imageframe/frames/flicking/BR.gif HTTP/1.1\r\n
Host: album.creneco.com\r\n
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0\r\n
Accept: image/png, image/*;q=0.8,*/*;q=0.5\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Referer: http://album.creneco.com/main.php?g2_view=imageframe.css&g2_frames=none%7Cshadow%7Cflicking\r\n
Cookie: GALLERYSID=78cb78dbabb51f330677f4a72c4f22b9\r\n
    
```



GRE encapsulated monitoring traffic



De encapsulated monitoring traffic

