



10G 40G 100G PACKET CAPTURE

Capturing the OPRA market data  
feed with ease.

Aaron Foo - CEO

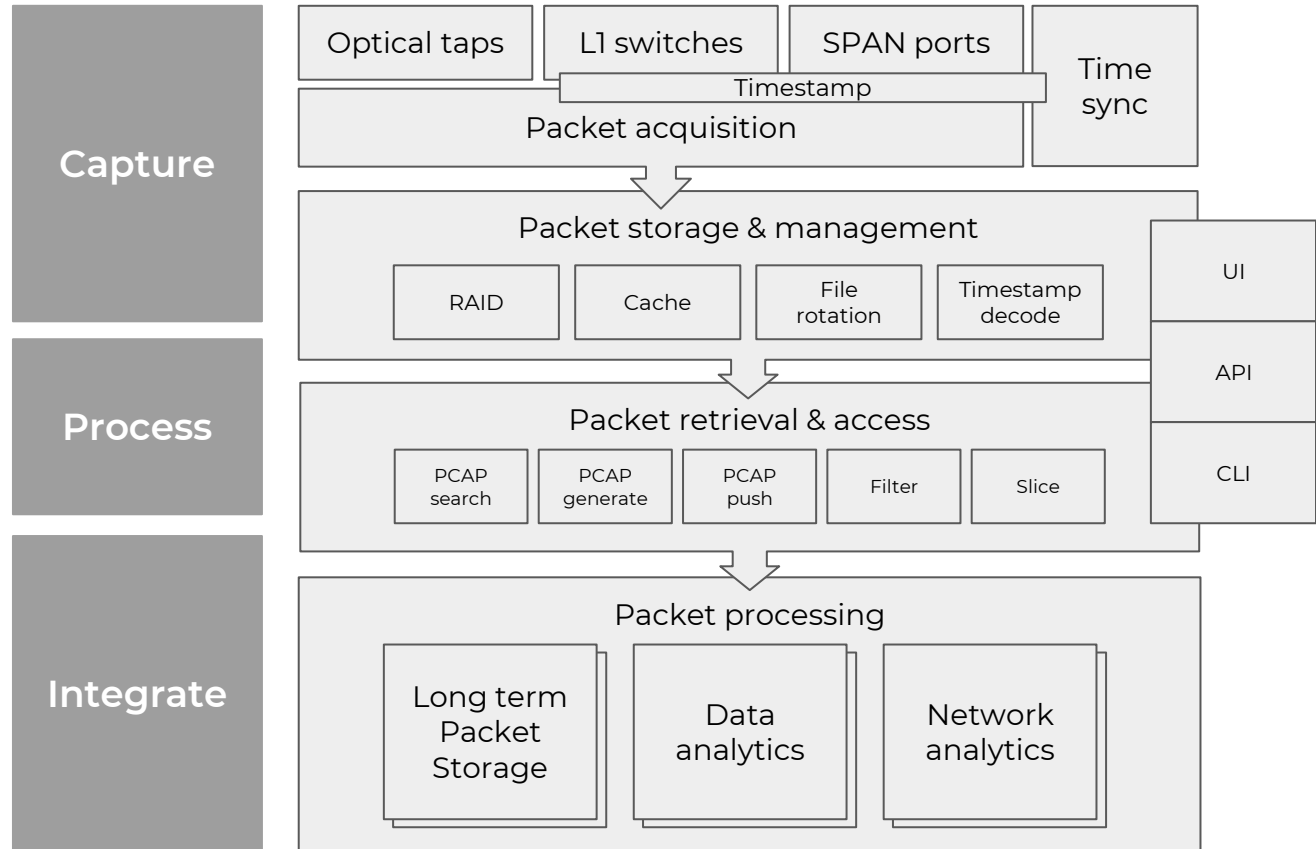
# FMADIO 100G

Full line rate 100G Packet capture, 148.8Mpps in a compact 1U form factor with x10 NVMe high speed SSDs and x2 QSFP28 interfaces.

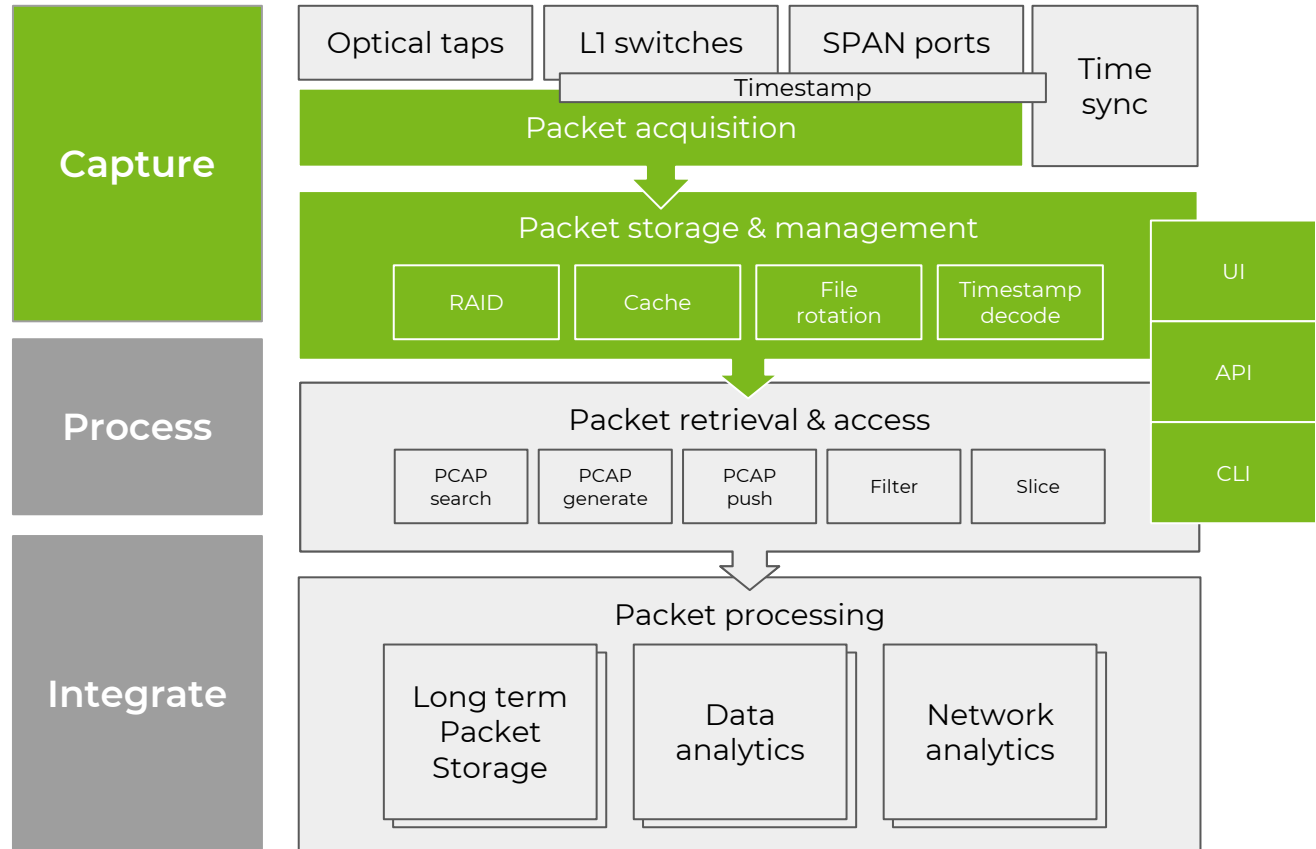
- 100Gbps Sustained Packet Capture
- 200Gbps Burst Packet Capture
- 2x QSFP28 Ports
- SR4 / LR4 / CX4 + FEC support
- 200Gbps Line Rate Packet Generator
- 16TB ~ 156 TB RAIDS Storage



# The anatomy of packet capture

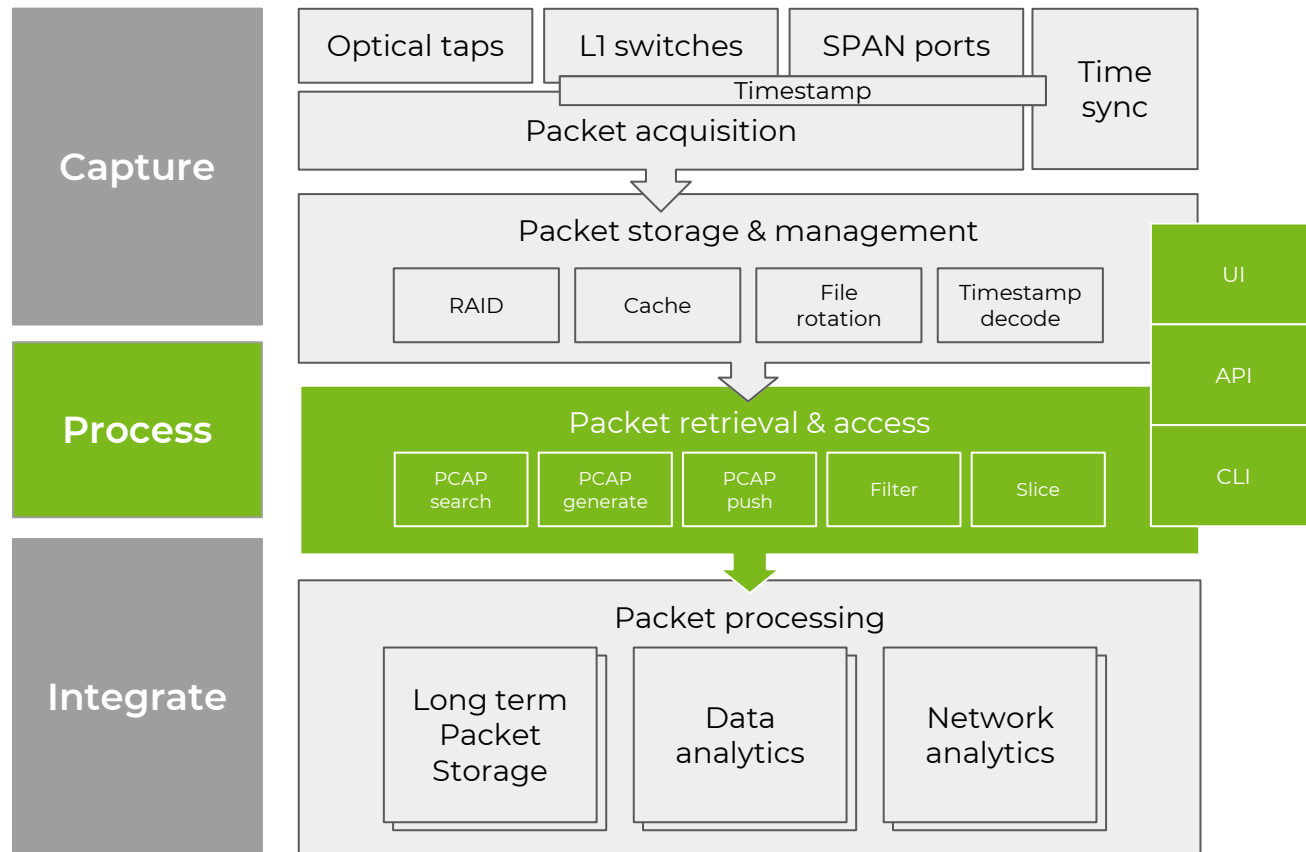


# Capture : FMADIO

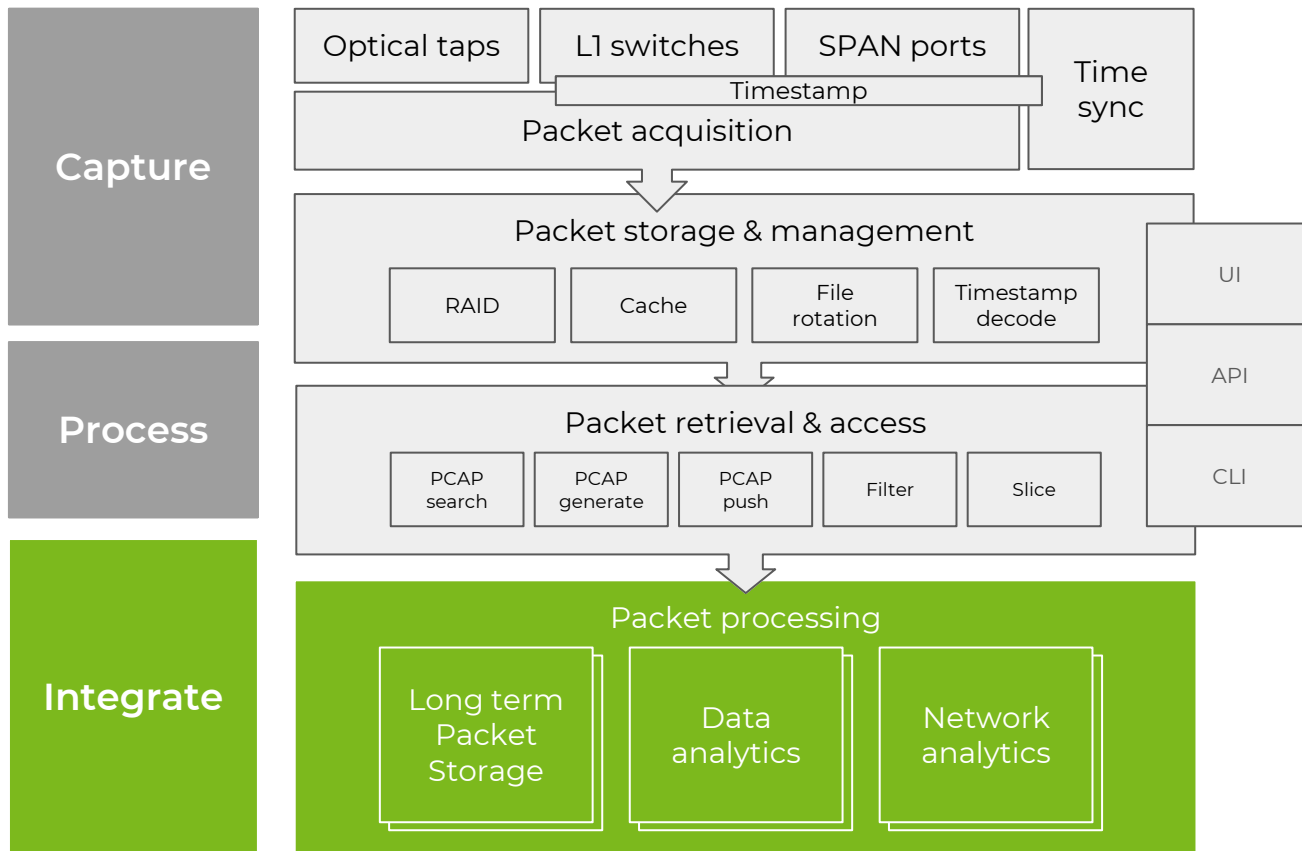




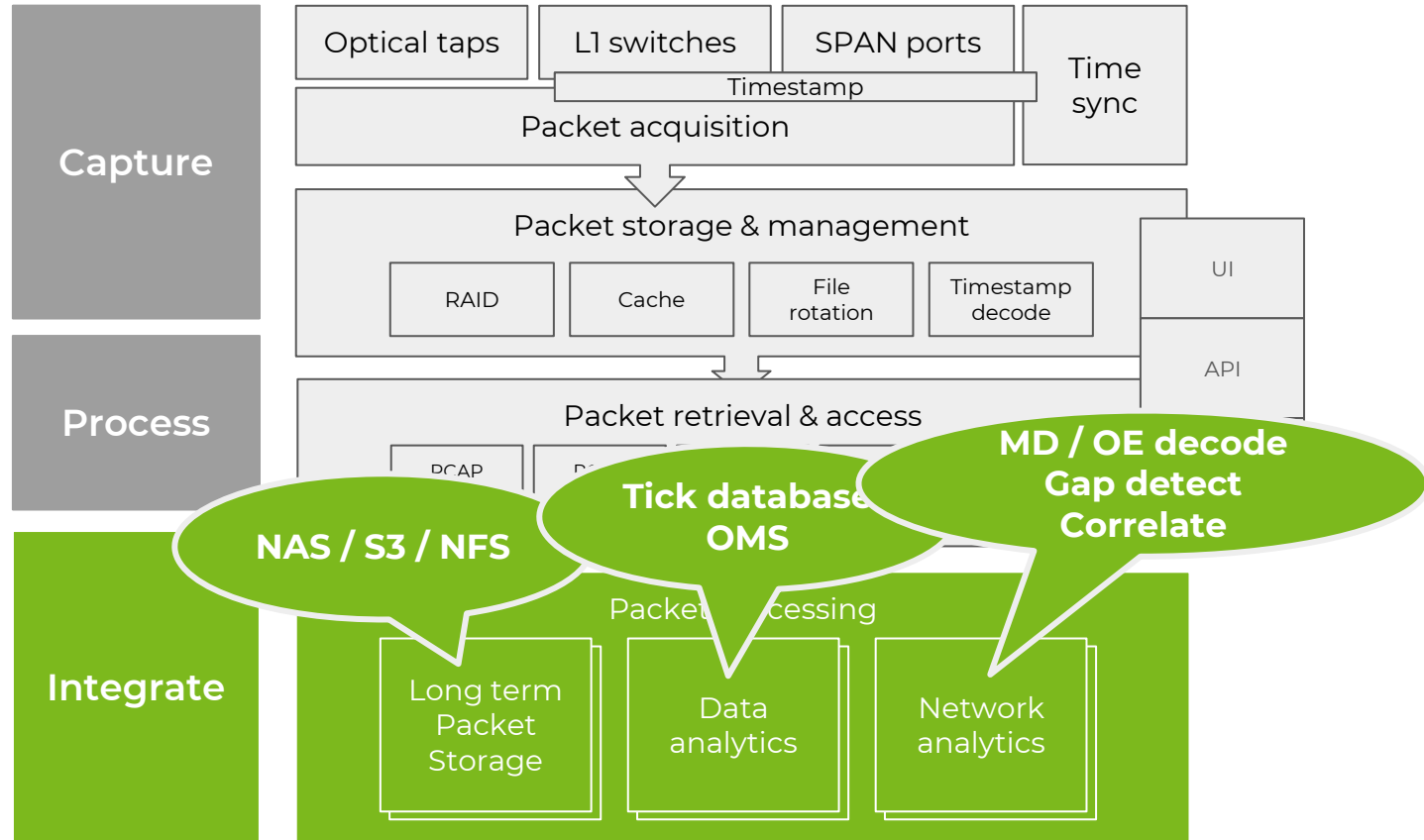
# Process : FMADIO



# Integrate : The fun stuff



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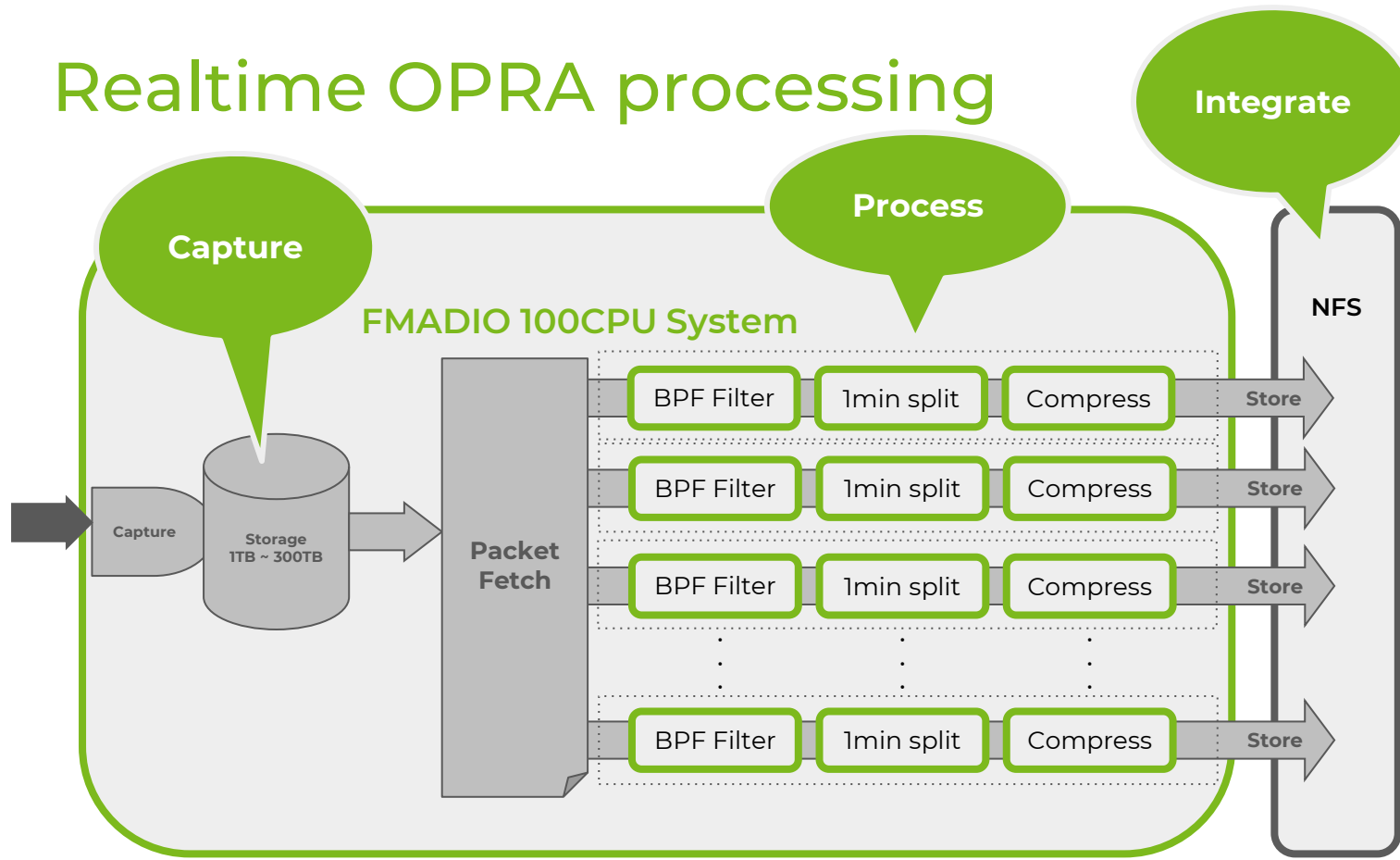
# Capturing the biggest data feed

OPRA is a consolidated data feed of all last-sale options quotations and information across 16 exchange entities in the USA with over 170 billion messages disseminated per day.

Date	100 Milliseconds			10 Milliseconds			Total per day (billions)
	Max Rate (million msg)	Bandwidth (GB)	Peak Packets (1000 packets)	Max Rate (million msg)	Bandwidth (GB)	Peak Packets (1000 packets)	
Jan 2023	11.561	3.198	698	1.307	0.360	77	172
Apr 2023	11.806	3.266	712	1.355	0.372	79	182
Jul 2023	12.231	3.922	1767	1.383	0.433	182	192
Oct 2023	12.677	4.059	1815	1.434	0.449	192	201



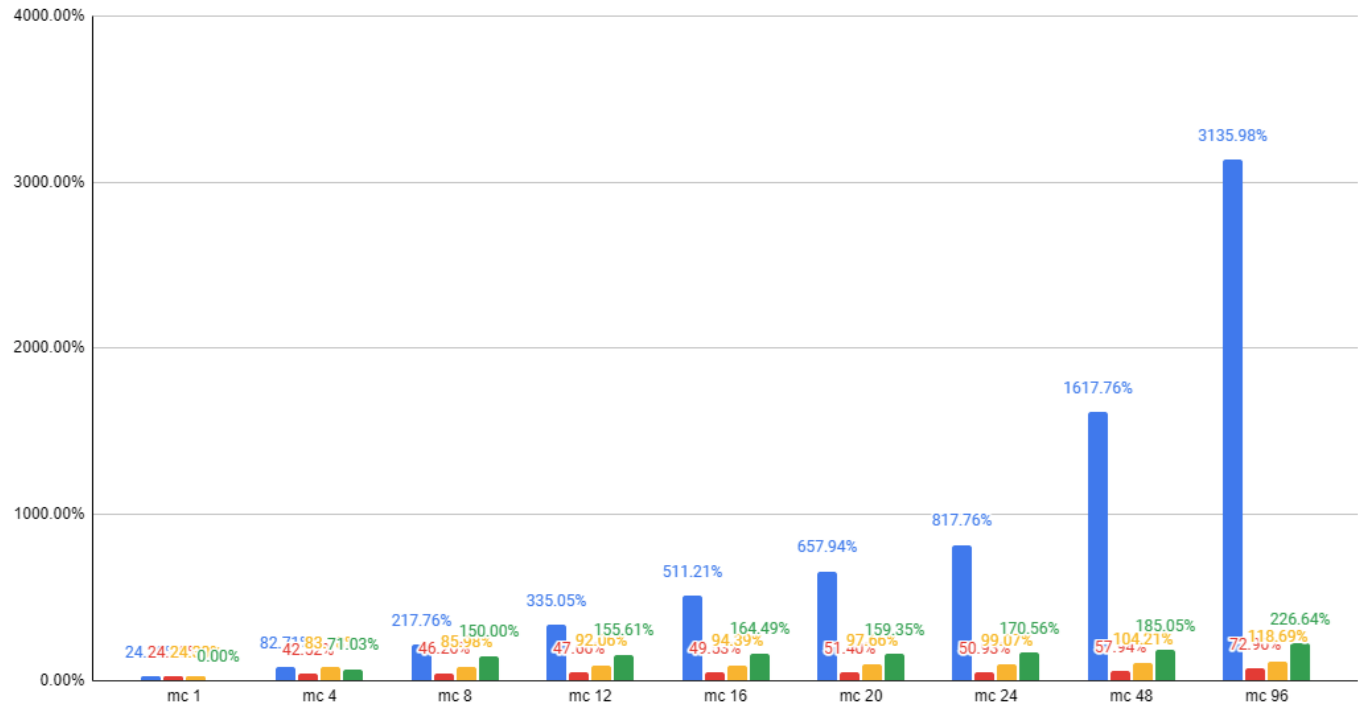
# Realtime OPRA processing



# Performance

96 Multicast Groups, 1Min Split, no Compression (100GB Sample)

■ 1 CPU   ■ 48 CPU @ 96MC (/2)   ■ 24 CPU @ 96MC (/4)   ■ 12 CPU @ 96MC (/8)



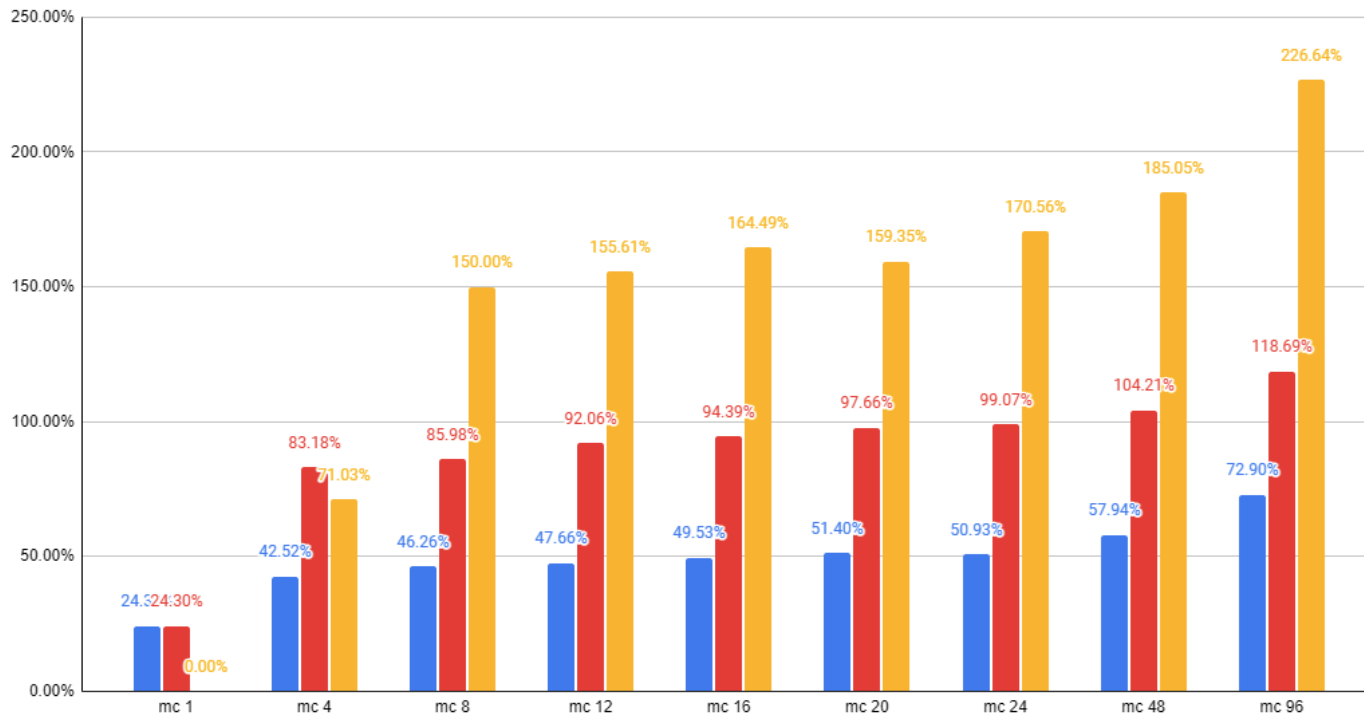
More info: <https://www.fmad.io/blog/push-compressed-realtime-filtered-pcap>

Not STAC  
Benchmark

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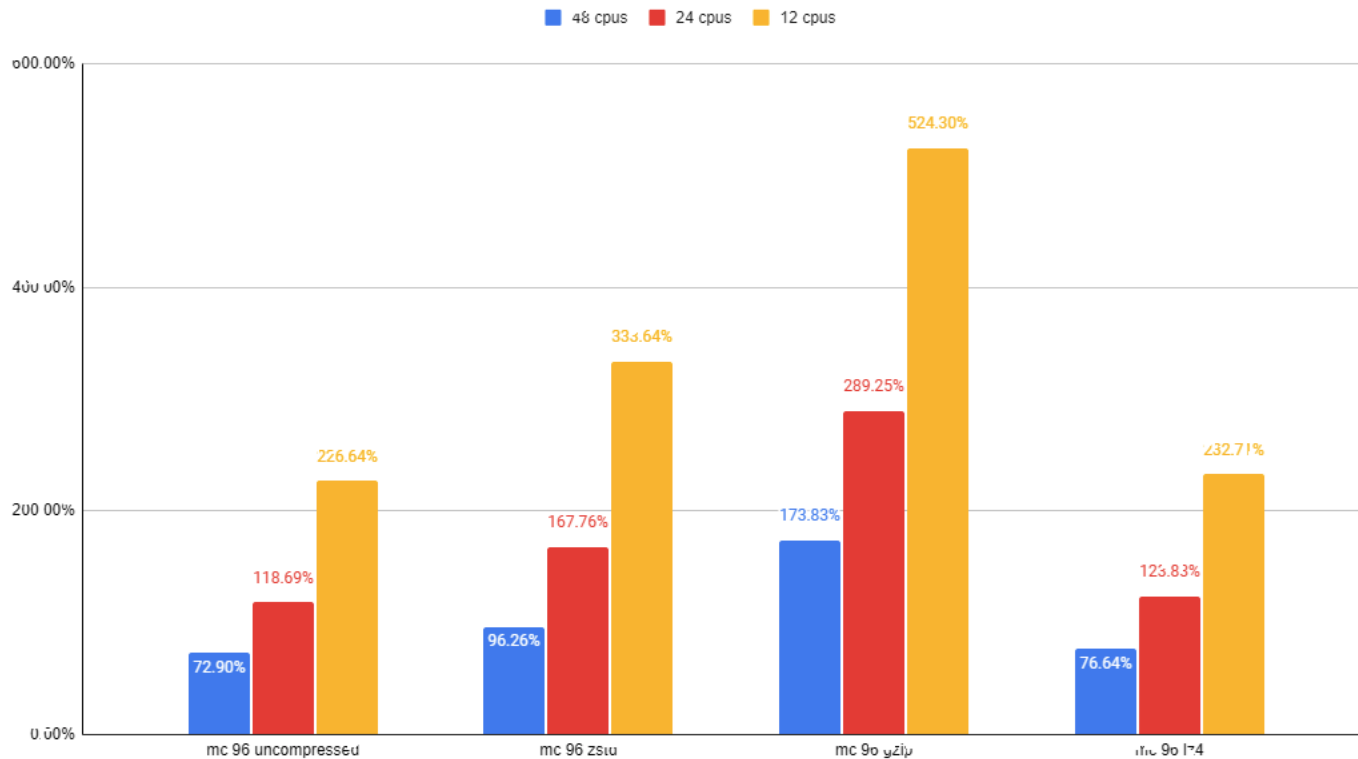


More info: <https://www.fmad.io/blog/push-compressed-realtime-filtered-pcap>

Not STAC  
Benchmark

# Performance

96 Multicast Groups with Compression

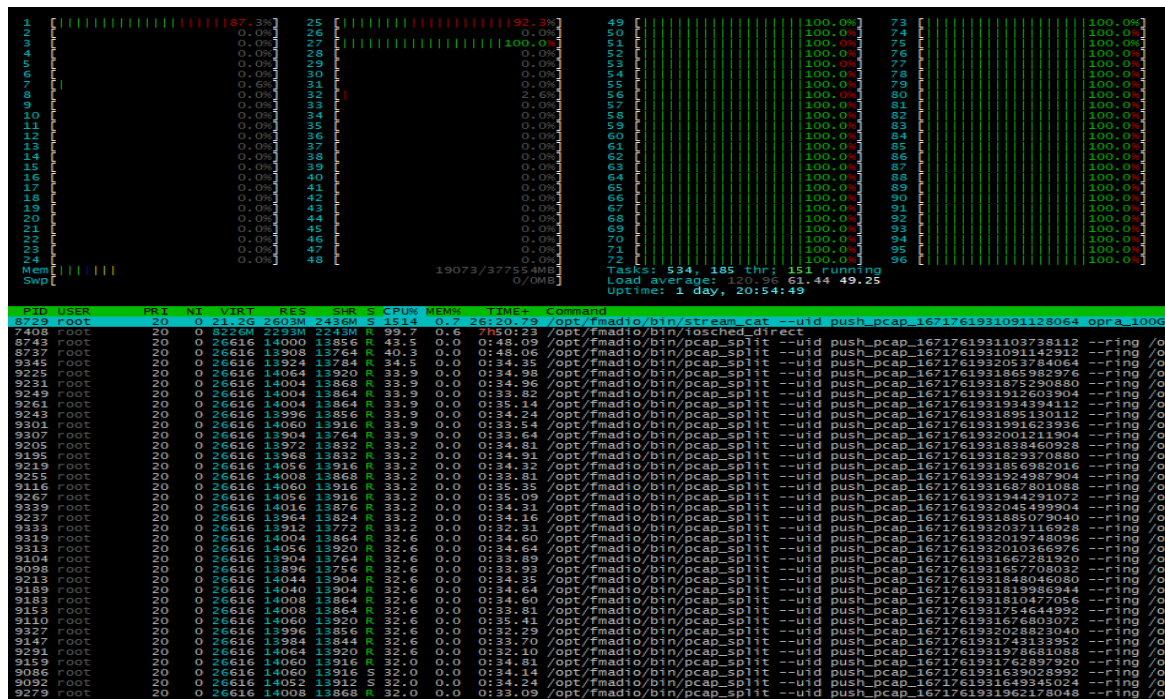


Not STAC  
Benchmark

# Performance

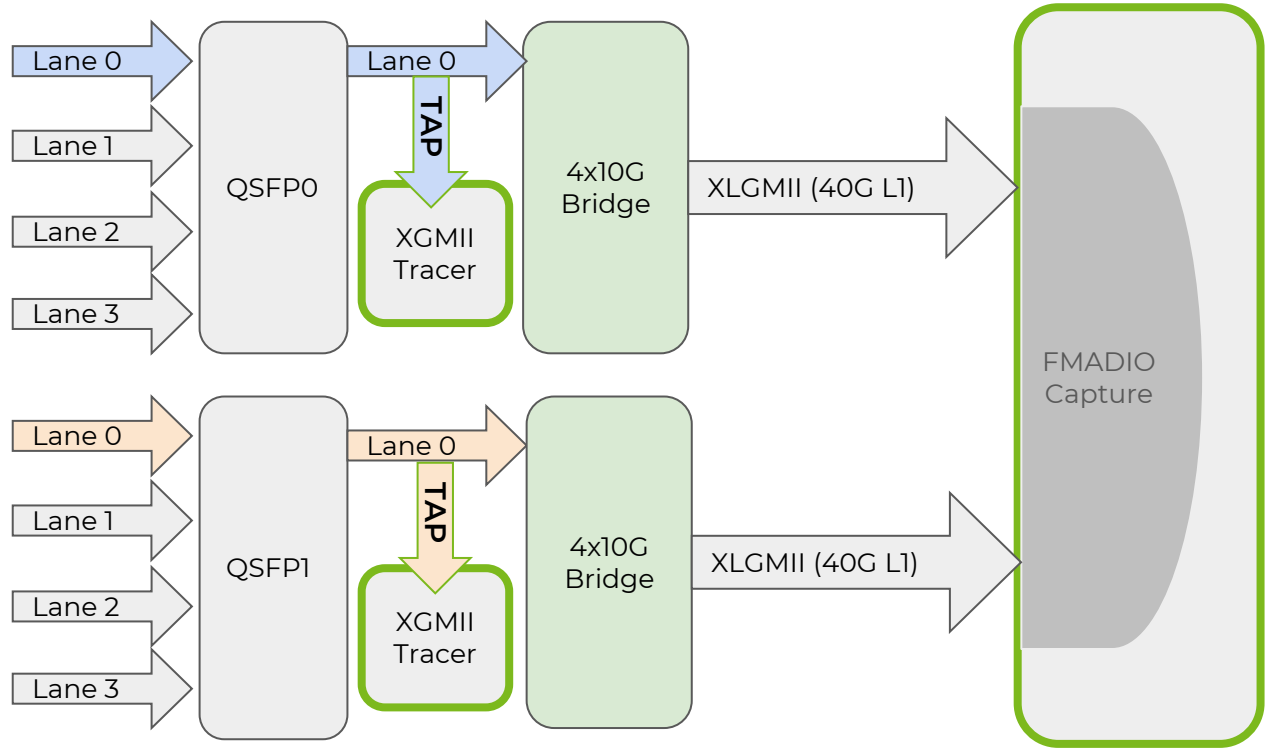
It really does use all 48 CPUs!

Not STAC  
Benchmark





# Layer 1 Capture



# Layer 1 Capture

```

BR0_PO : [00000000:00000009] Cnt: 1 E:0 P:1 00 b76a33b163000a08
BR0_PO : [00000001:0000000a] Cnt: 1 E:0 P:1 00 689710000000bcb6
BR0_PO : [00000002:0000000b] Cnt: 1 E:0 P:1 00 eda071c5a314393f
BR0_PO : [00000003:0000000c] Cnt: 1 E:0 P:1 00 ecd70dee46a8e31a
BR0_PO : [00000004:0000000d] Cnt: 1 E:0 P:1 00 000012cad1c4184f
BR0_PO : [00000005:0000000e] Cnt: 1 E:0 P:1 00 79831600f0b3af02
BR0_PO : [00000006:0000000f] Cnt: 1 E:0 P:1 00 10804d8e2bbfdc70
BR0_PO : [00000007:00000010] Cnt: 1 E:0 P:1 00 0101000050250b02
BR0_PO : [00000008:00000011] Cnt: 1 E:0 P:1 00 6300bcb6b76a0a08
BR0_PO : [00000009:00000012] Cnt: 1 E:0 P:1 c0 07fdc3e718c733b1 E
BR0_PO : [0000000a:00000013] Cnt: 4634 E:0 P:0 ff 0707070707070707
BR0_PO : [0000000b:00000014] Cnt: 1 E:0 P:0 01 d5555555555555fb S
BR0_PO : [0000000c:00000015] Cnt: 1 E:0 P:1 00 fb84962ab906549b
BR0_PO : [0000000d:00000016] Cnt: 1 E:0 P:1 00 d6e460d8f0a8c6d0
BR0_PO : [0000000e:00000017] Cnt: 1 E:0 P:1 00 5840bd97321a8c2b
BR0_PO : [0000000f:00000018] Cnt: 1 E:0 P:1 00 000048e4a54102fc
BR0_PO : [00000010:00000019] Cnt: 1 E:0 P:1 00 d1d8f34cf7cf1000
BR0_PO : [00000011:0000001a] Cnt: 1 E:0 P:1 00 bddf9bdc38192a1
BR0_PO : [00000012:0000001b] Cnt: 1 E:0 P:1 00 097db8539a71f29d
BR0_PO : [00000013:0000001c] Cnt: 1 E:0 P:1 00 1080bd952bbfdc70
BR0_PO : [00000014:0000001d] Cnt: 1 E:0 P:1 00 01010000b91c3103
BR0_PO : [00000015:0000001e] Cnt: 1 E:0 P:1 00 6300bcb6b76a0a08
BR0_PO : [00000016:0000001f] Cnt: 1 E:0 P:1 c0 07fd58cef84d34b1 E
BR0_PO : [00000017:00000020] Cnt: 4451 E:0 P:0 ff 0707070707070707
BR0_PO : [00000018:00000021] Cnt: 1 E:0 P:0 01 d5555555555555fb S
BR0_PO : [00000019:00000022] Cnt: 1 E:0 P:1 00 160051215d5ed5e0
BR0_PO : [0000001a:00000023] Cnt: 1 E:0 P:1 00 104500086fa1bc3e
BR0_PO : [0000001b:00000024] Cnt: 1 E:0 P:1 00 0640004083cd3400
BR0_PO : [0000001c:00000025] Cnt: 1 E:0 P:1 00 a8c08202a8c0aee6
BR0_PO : [0000001d:00000026] Cnt: 1 E:0 P:1 00 79831600f0b3af02
BR0_PO : [0000001e:00000027] Cnt: 1 E:0 P:1 00 108081982bbfdc70
BR0_PO : [0000001f:00000028] Cnt: 1 E:0 P:1 00 d8f043b3613b4696
    
```



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Choose FMADIO on your cards for  
more information.