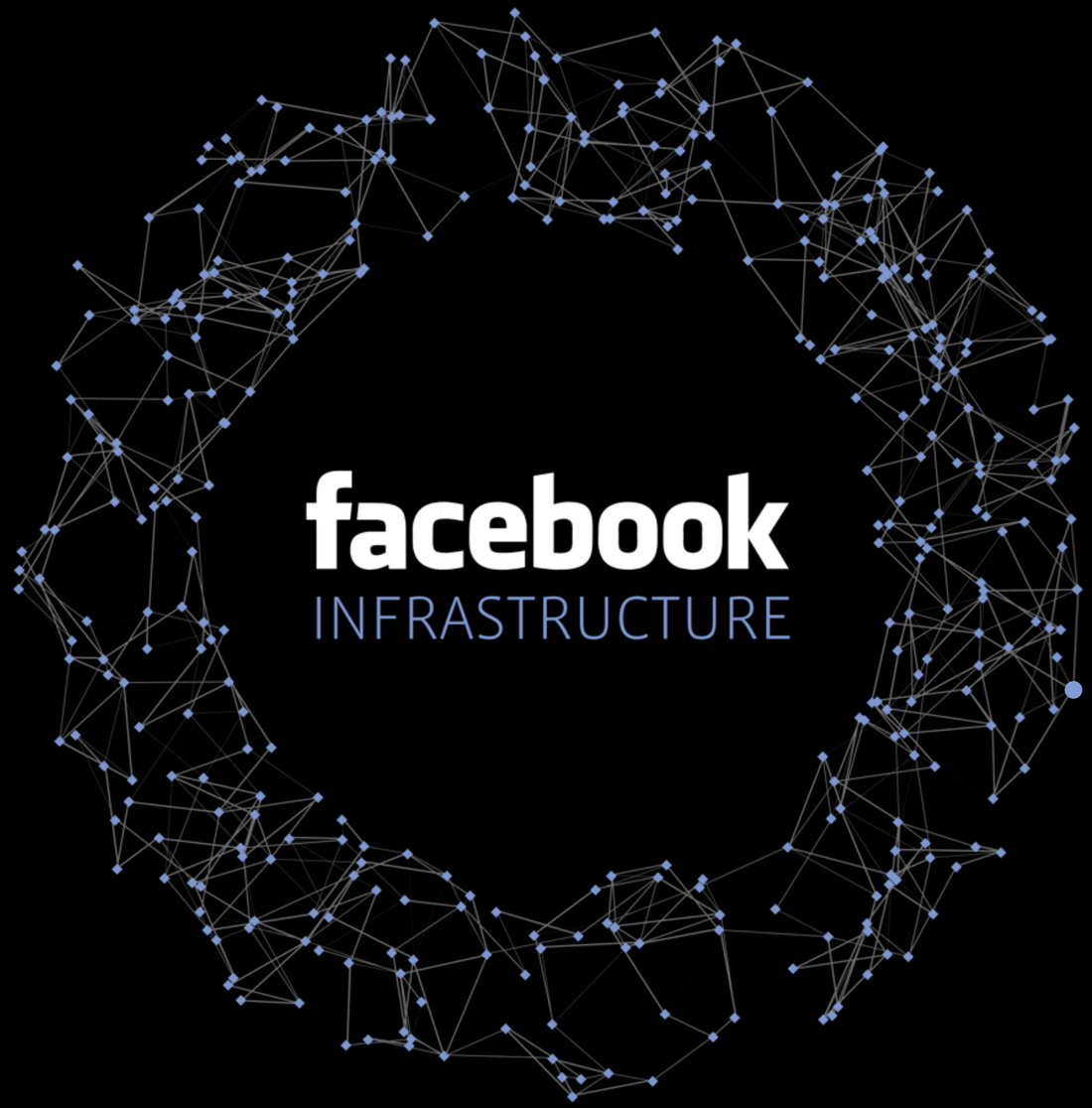
facebook

Dr. NMS

or: How Facebook Learned to Stop Worrying and L●ve the Network

Jose Leitao [jleitao@fb.com]



ZERO IMPACT NETWORK

Jose Leitao added a new photo

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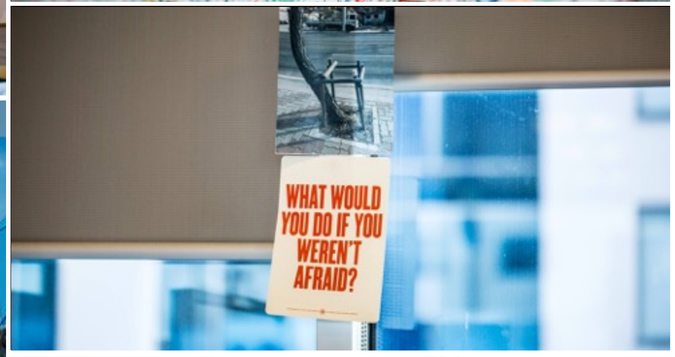
We'll be talking about



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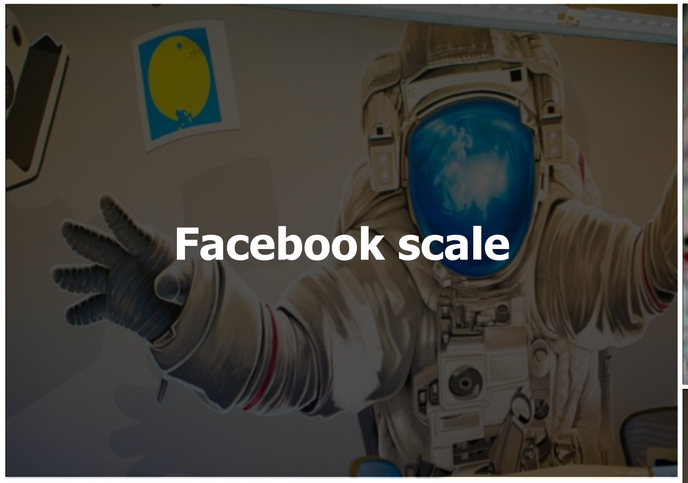

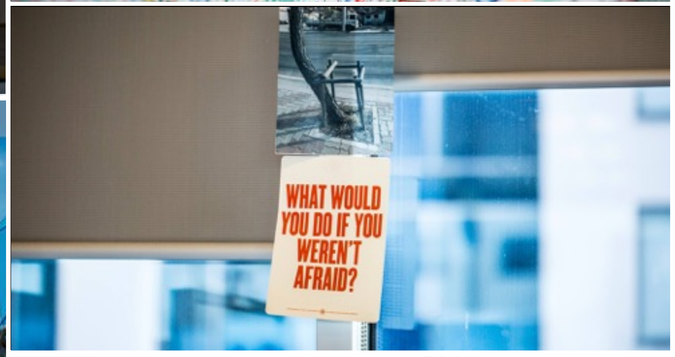

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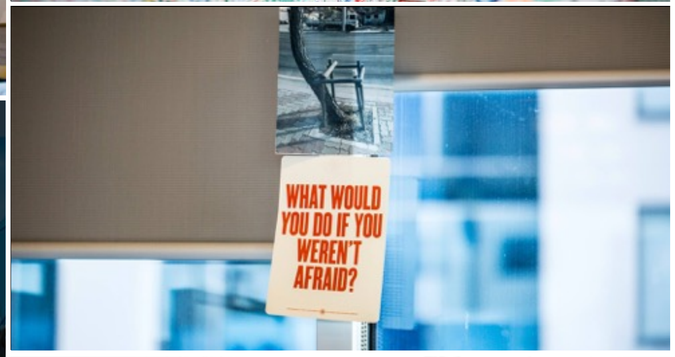

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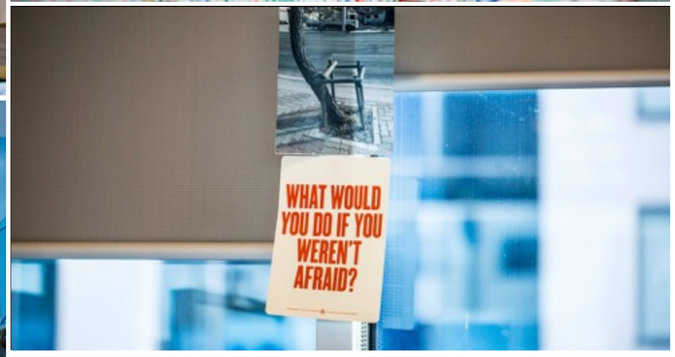

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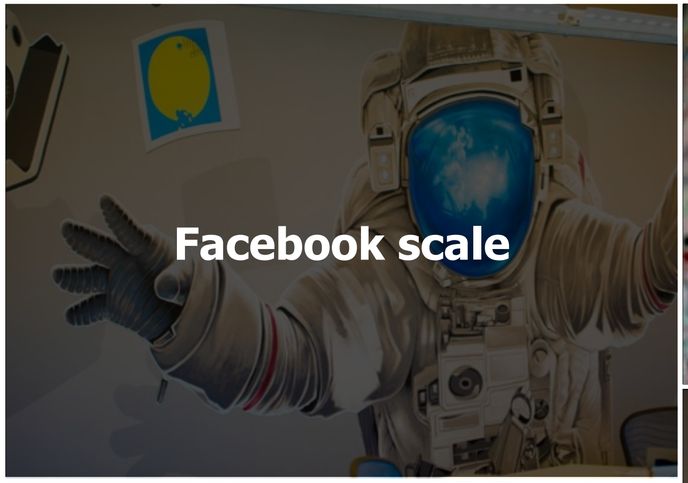

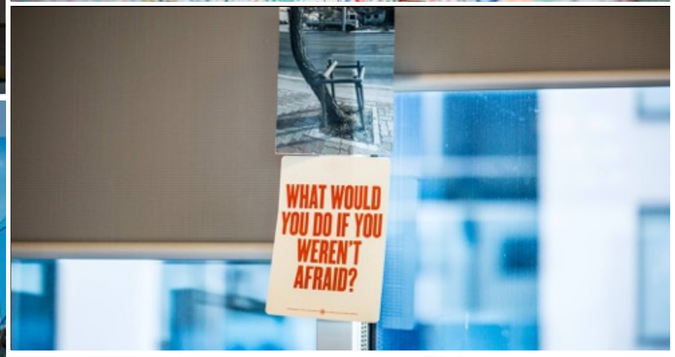

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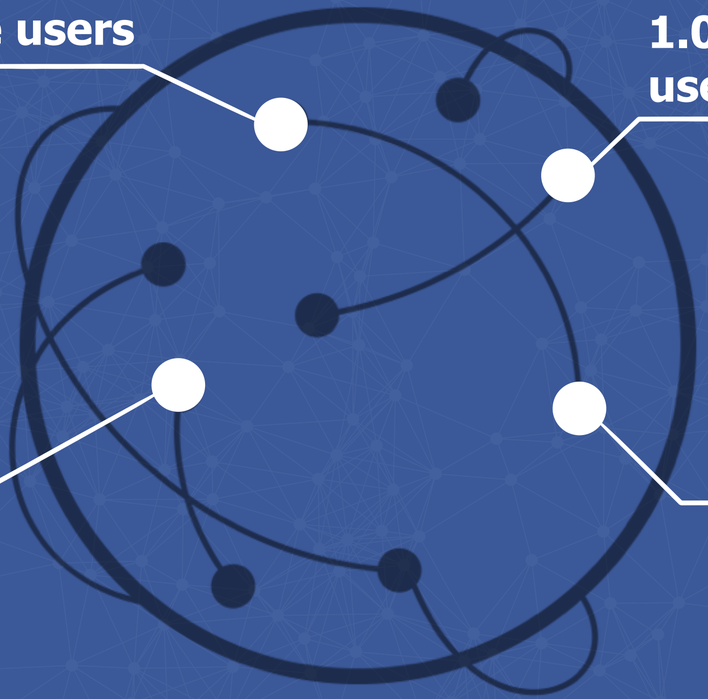
Facebook scale

as of March 2016

1.51 billion mobile monthly active users

1.09 billion daily active users on average



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as of March 2016

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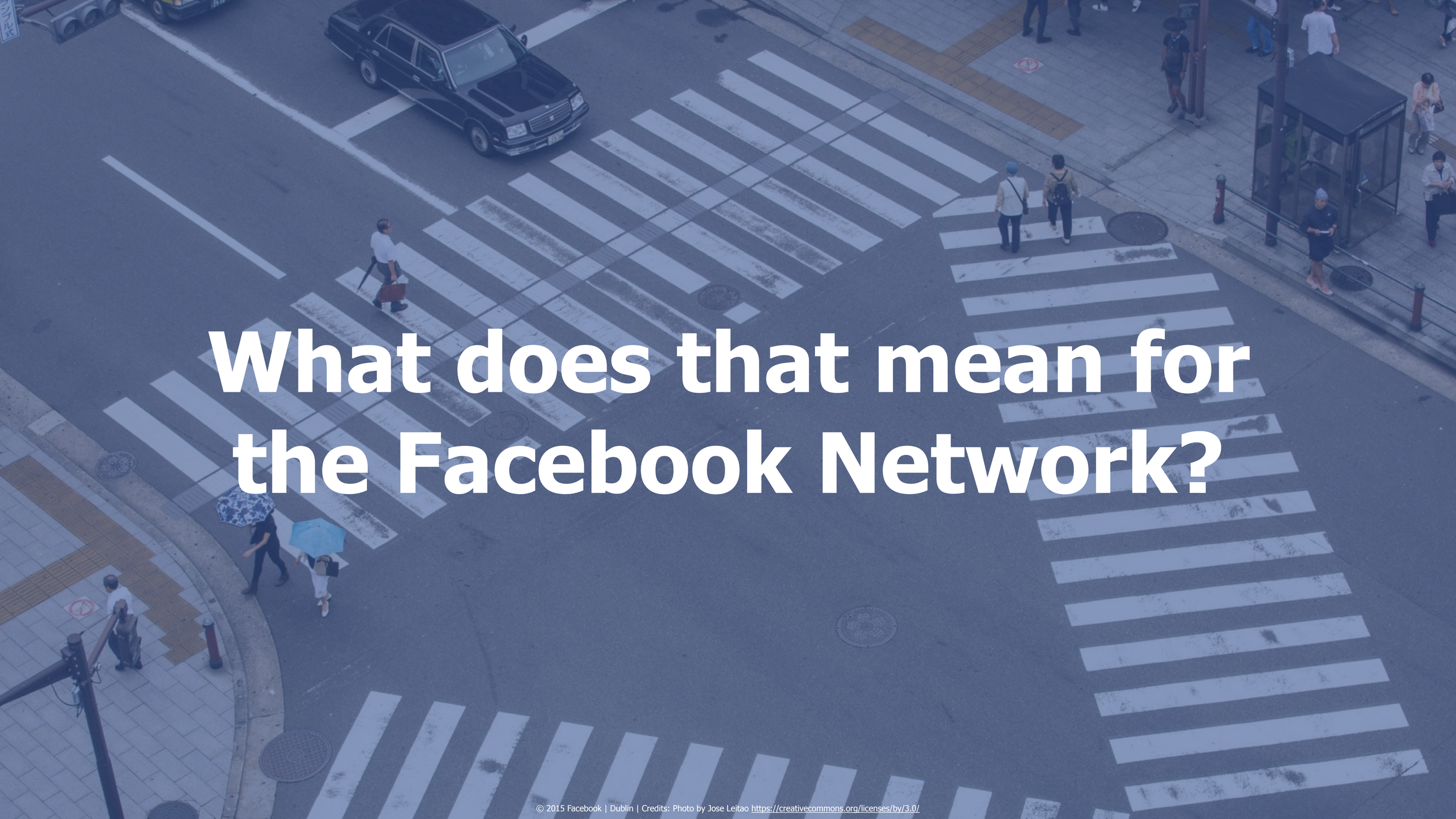
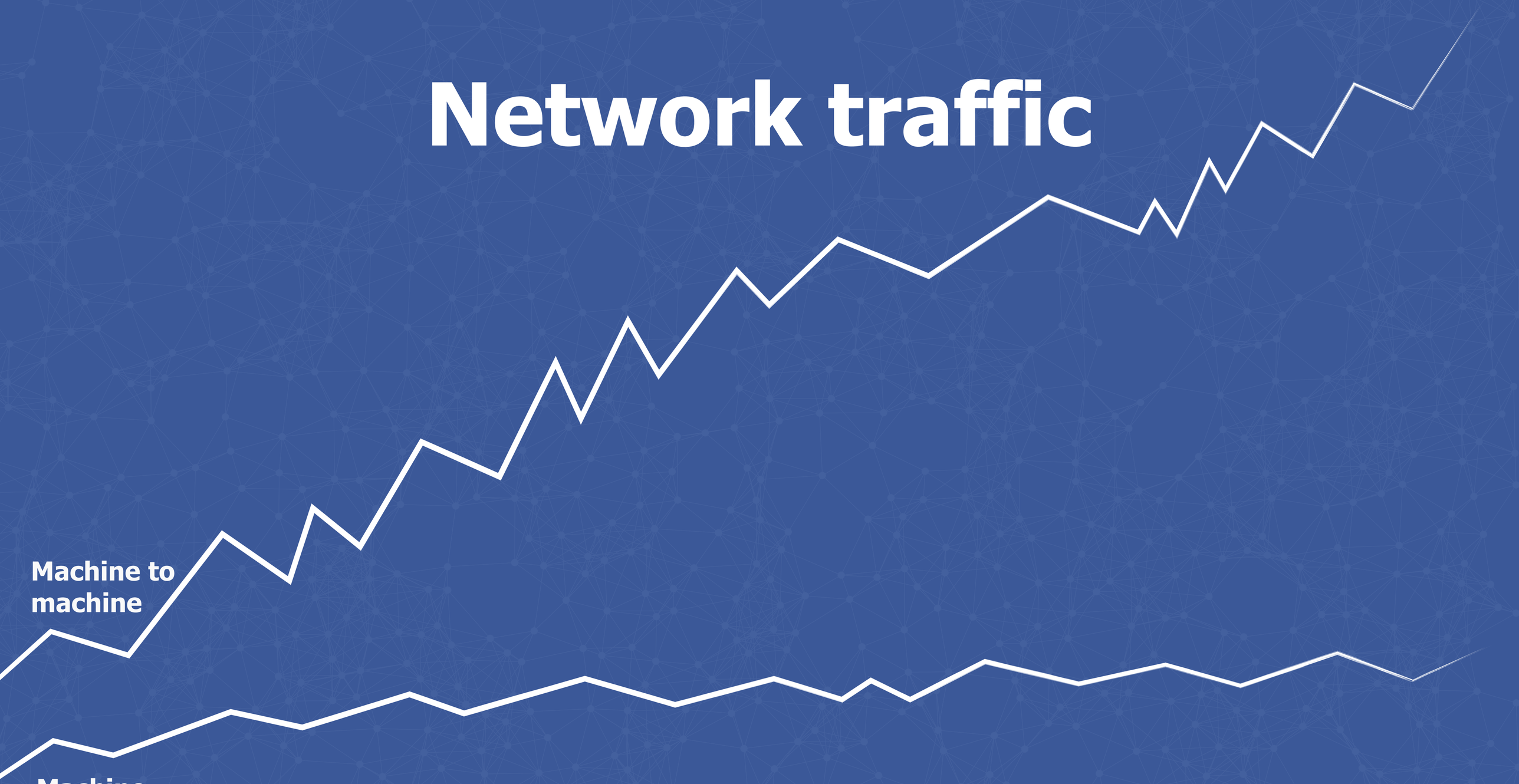
989 million mobile daily active users on average

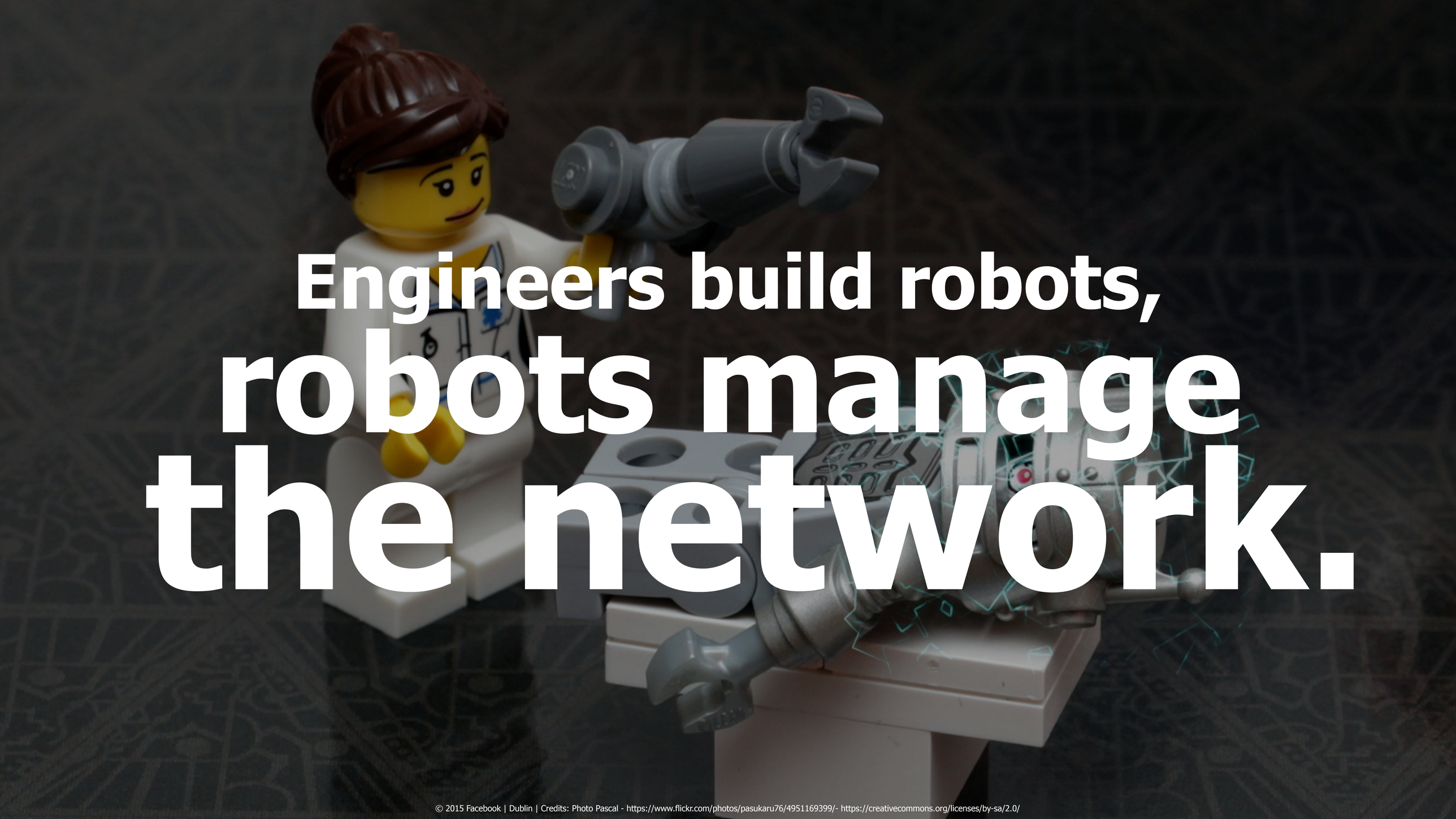
Approximately 84.2% of our daily active users are outside the US and Canada



What does that mean for the Facebook Network?

Network traffic





Now, let's talk about

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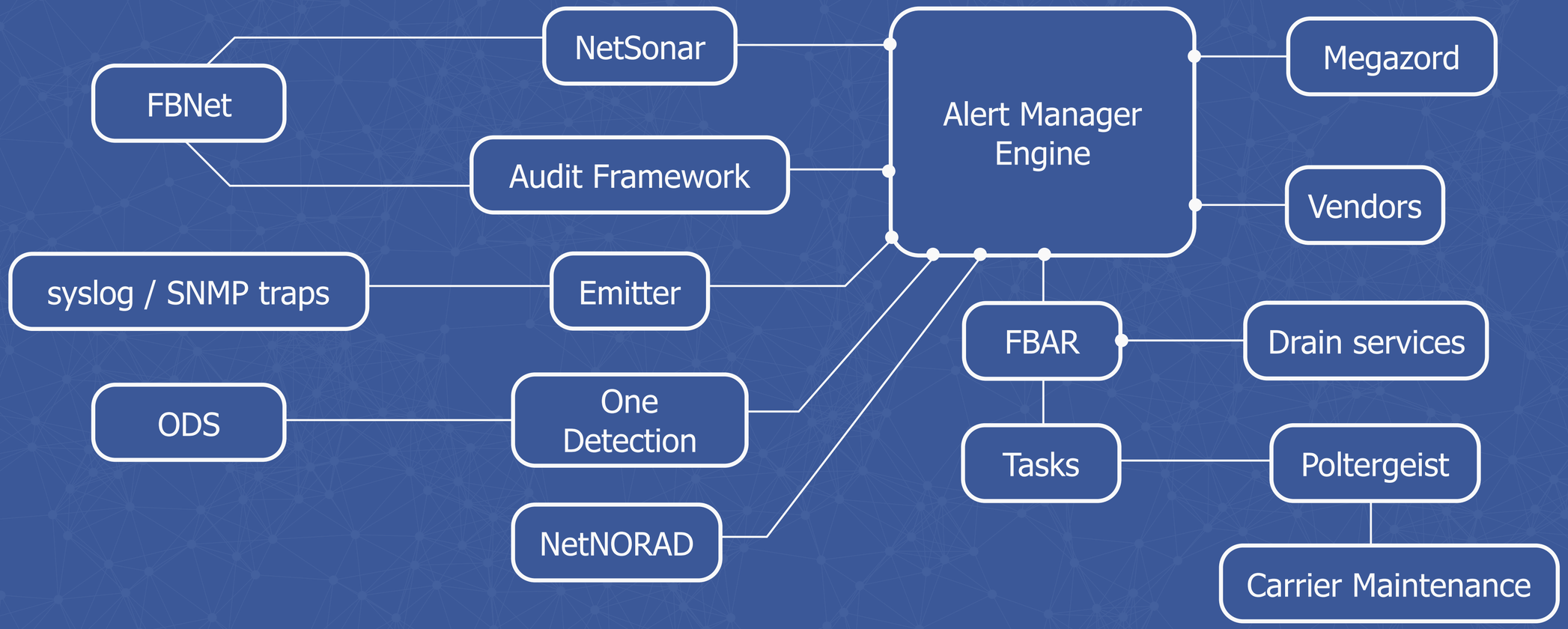
Facebook Defined Networking



FBNet

The brains to help guide our robots run the network

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Facebook Def g

NetSonar

FBNet

Audit Framework

syslog / SNMP traps

Emitter

ODS

One Detection

NetNORAD

NetNORAD

Our Packet Loss detection system

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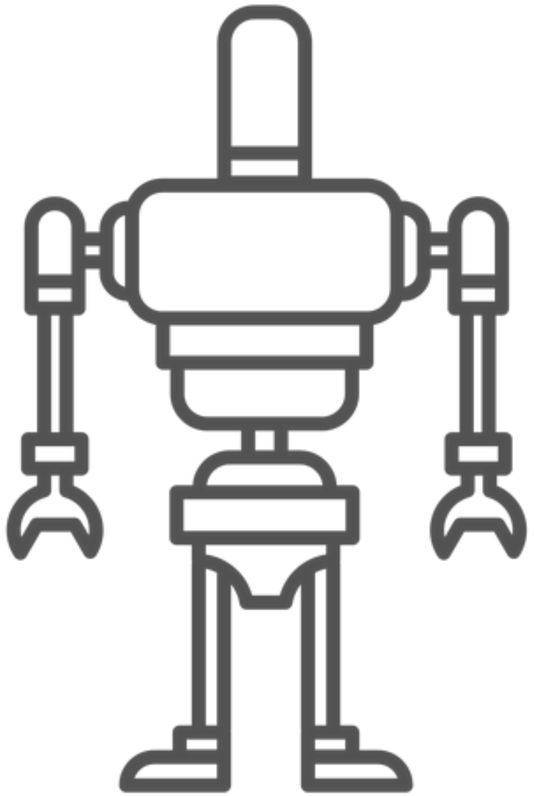
Megazord

Our alarm correlation engine



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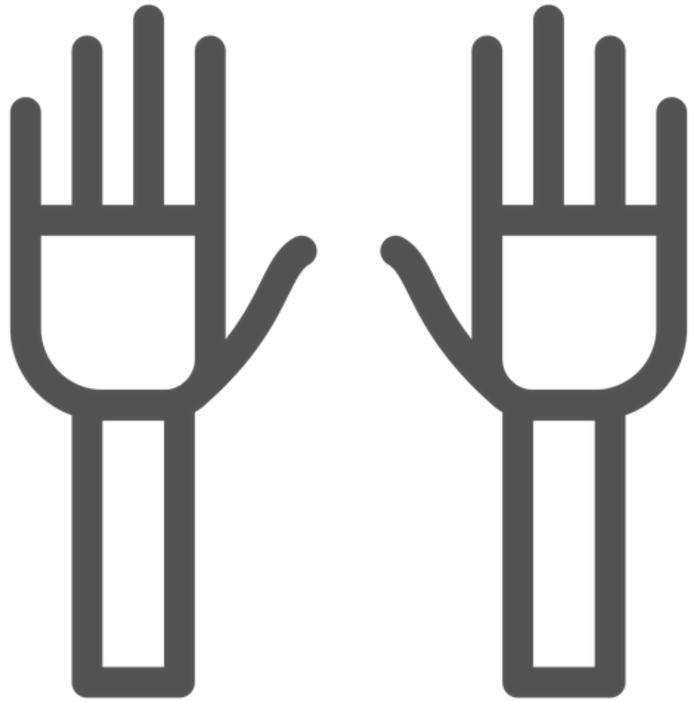
Drain Services

The movers of traffic on the network devices



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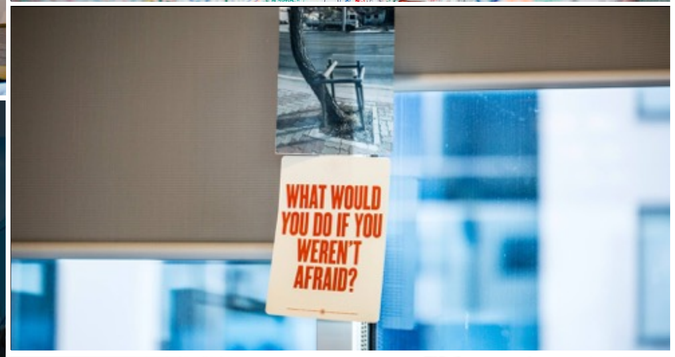

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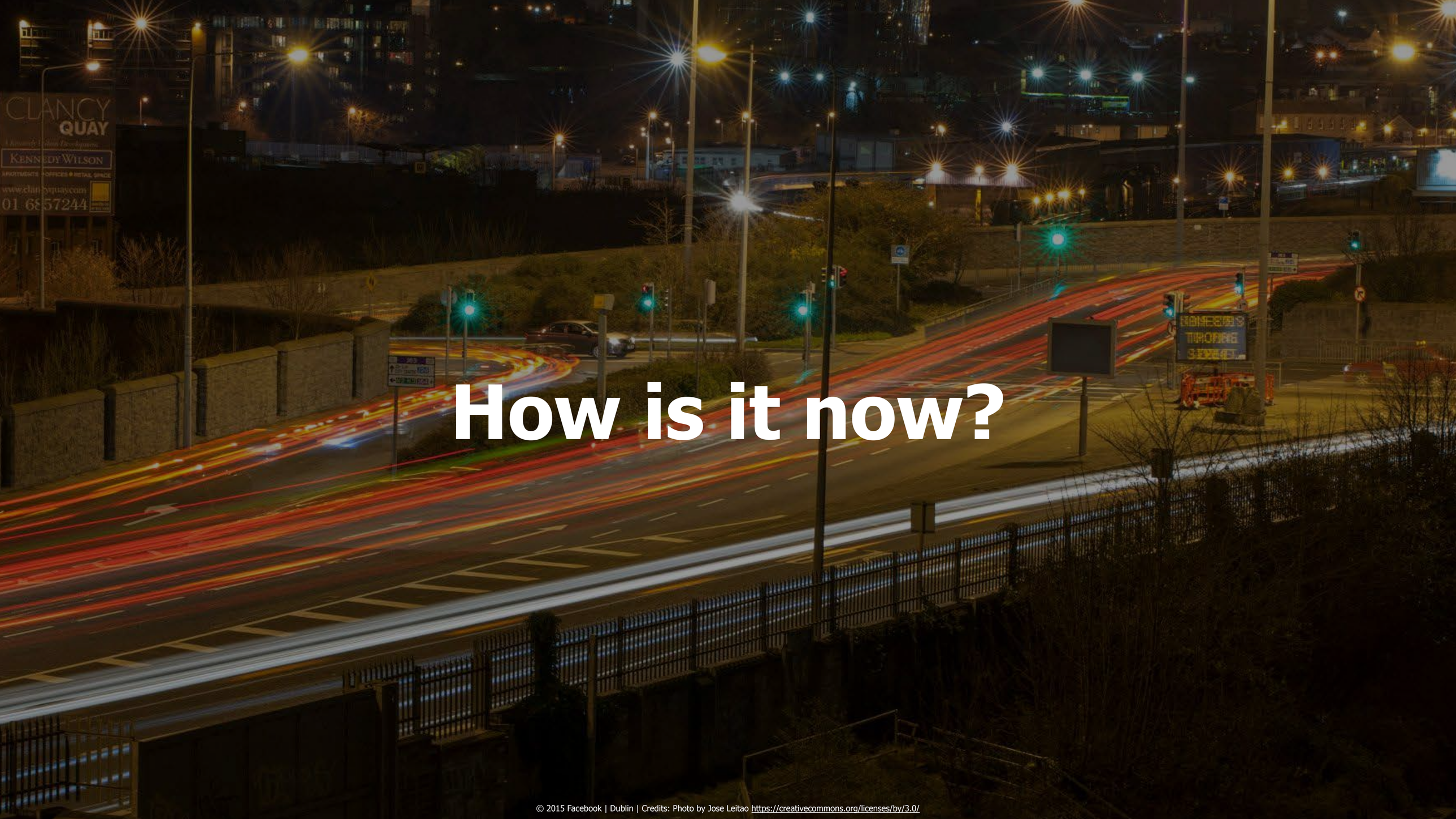
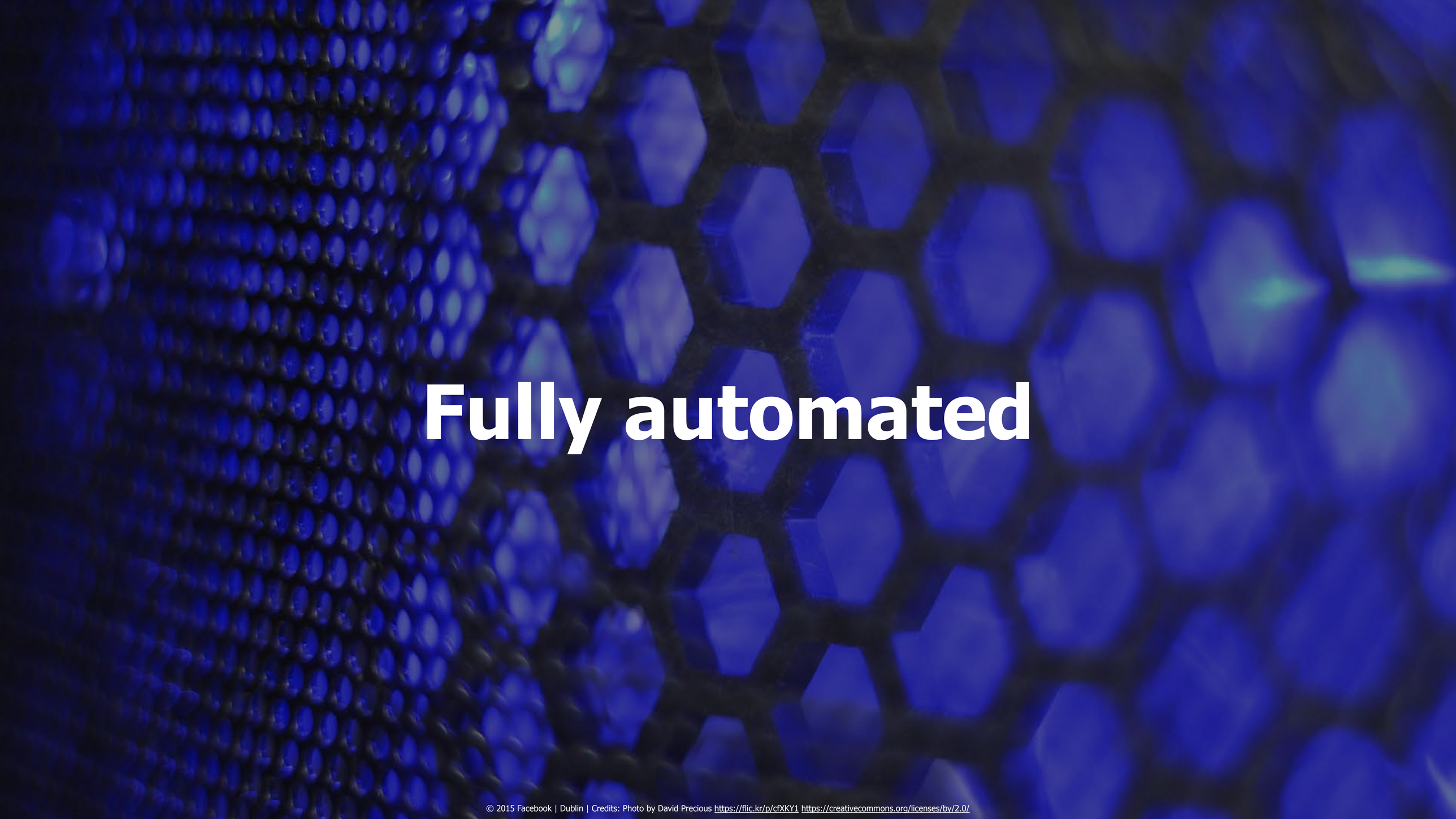
Circuits @ scale

Manual approach

Hybrid approach



How is it now?



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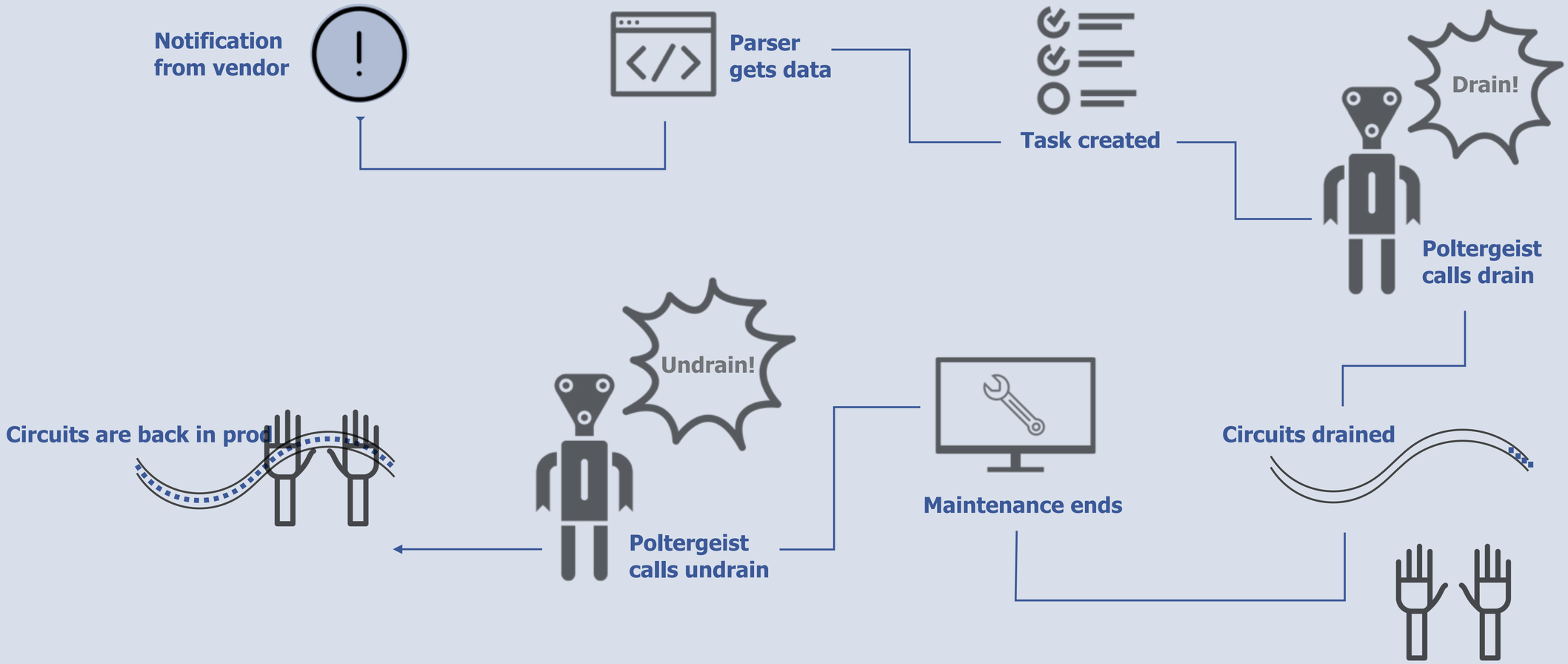
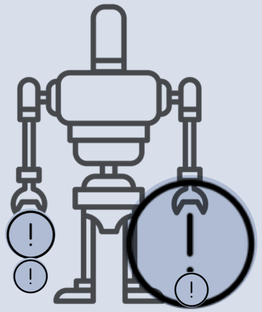


Seriously…

How is it now?



Link down alarms

Megazord groups alarms

Vendors logs event in OperDB

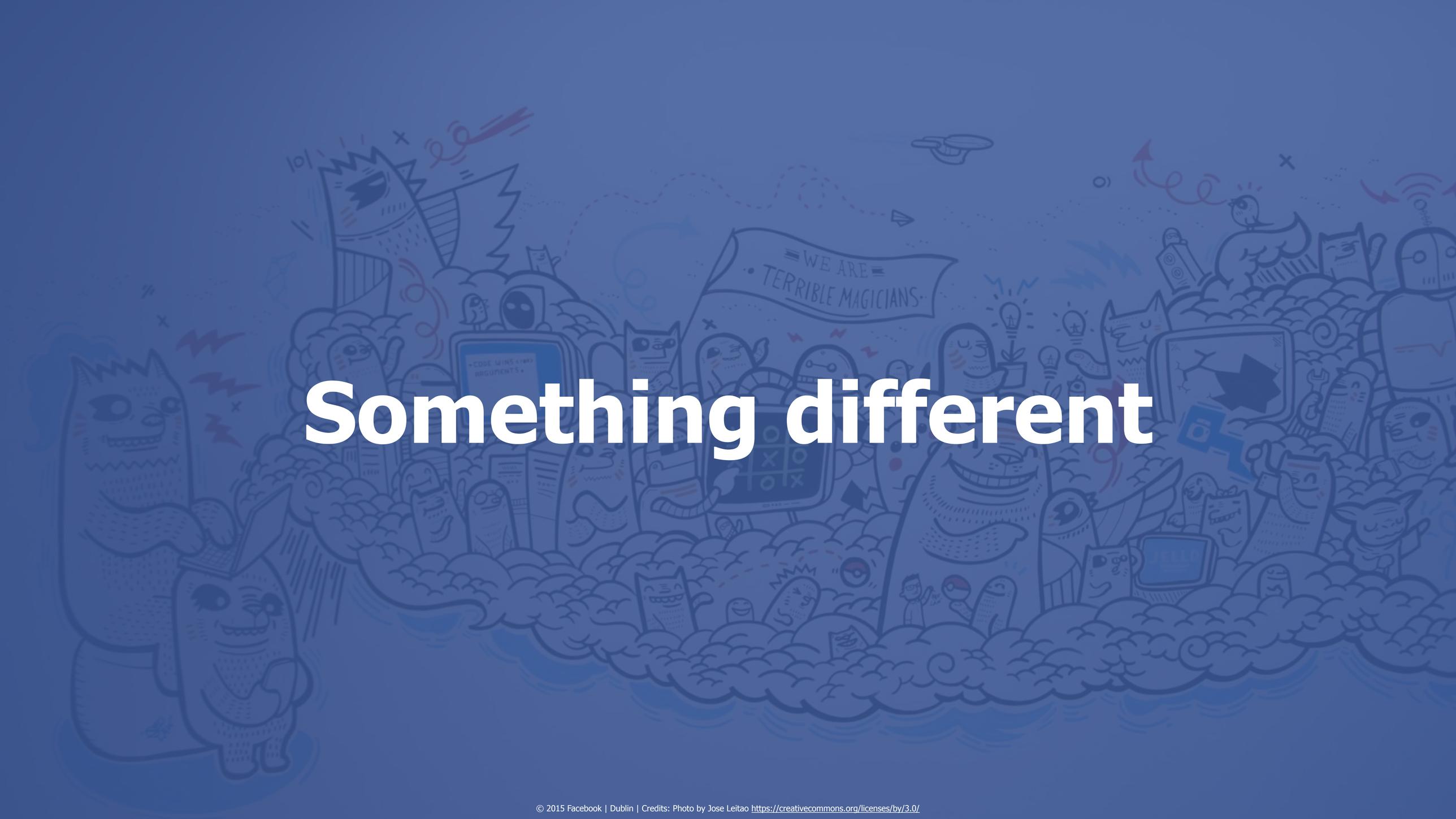
Vendors checks FBNet

Task created

Carrier is contacted with details of event

Links come back [Monitoring period starts]

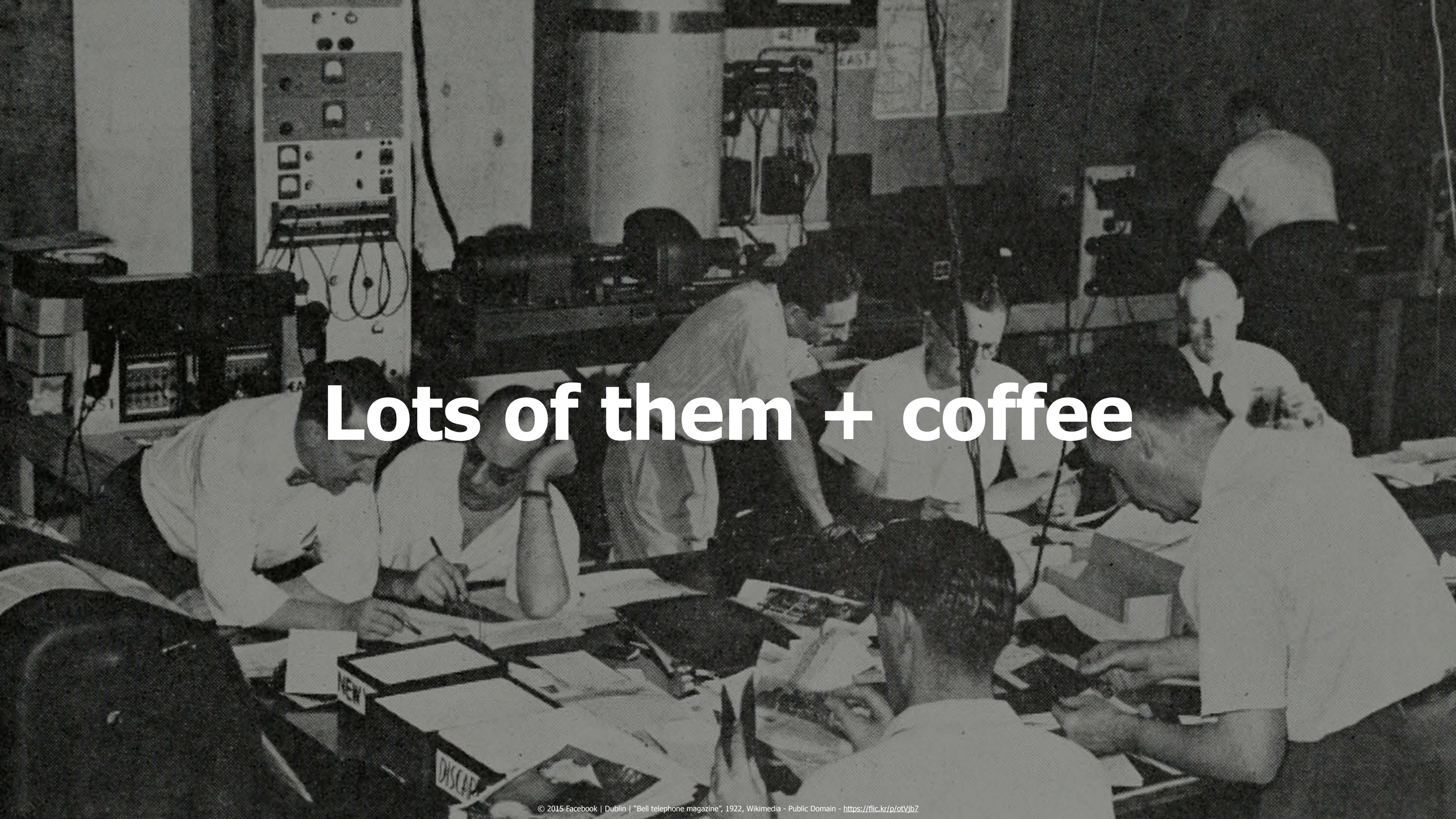
Event is closed [Monitoring period ends]



Something different

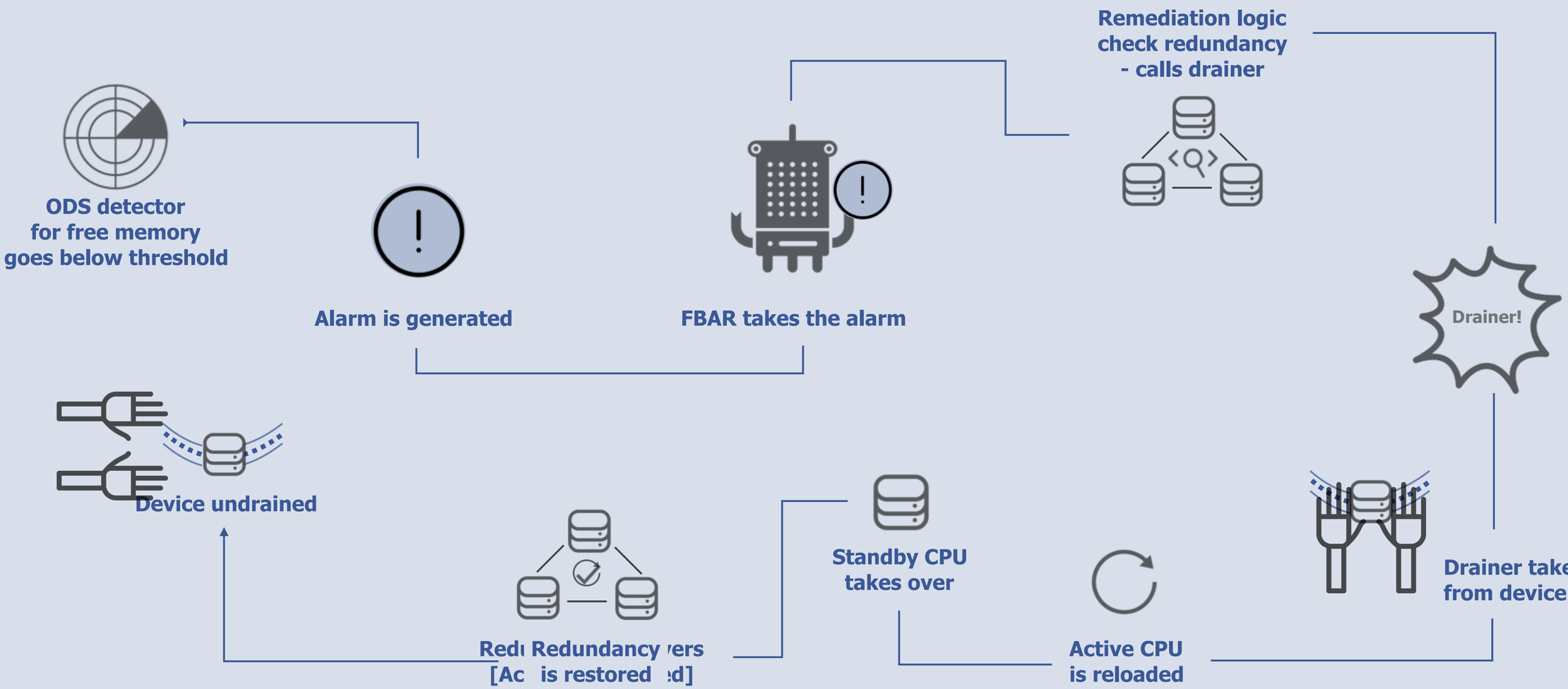
The memory leak debacle

Free memory over time



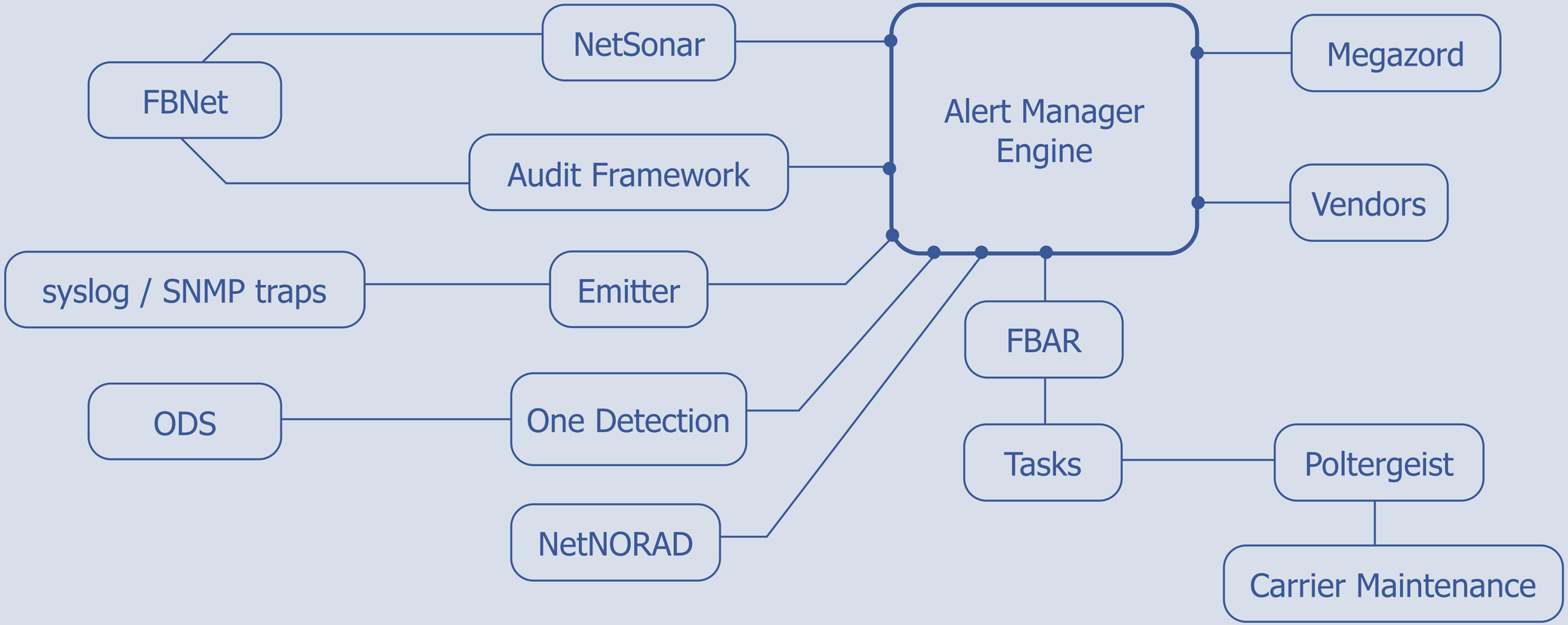
Lots of them + coffee

How is it now?



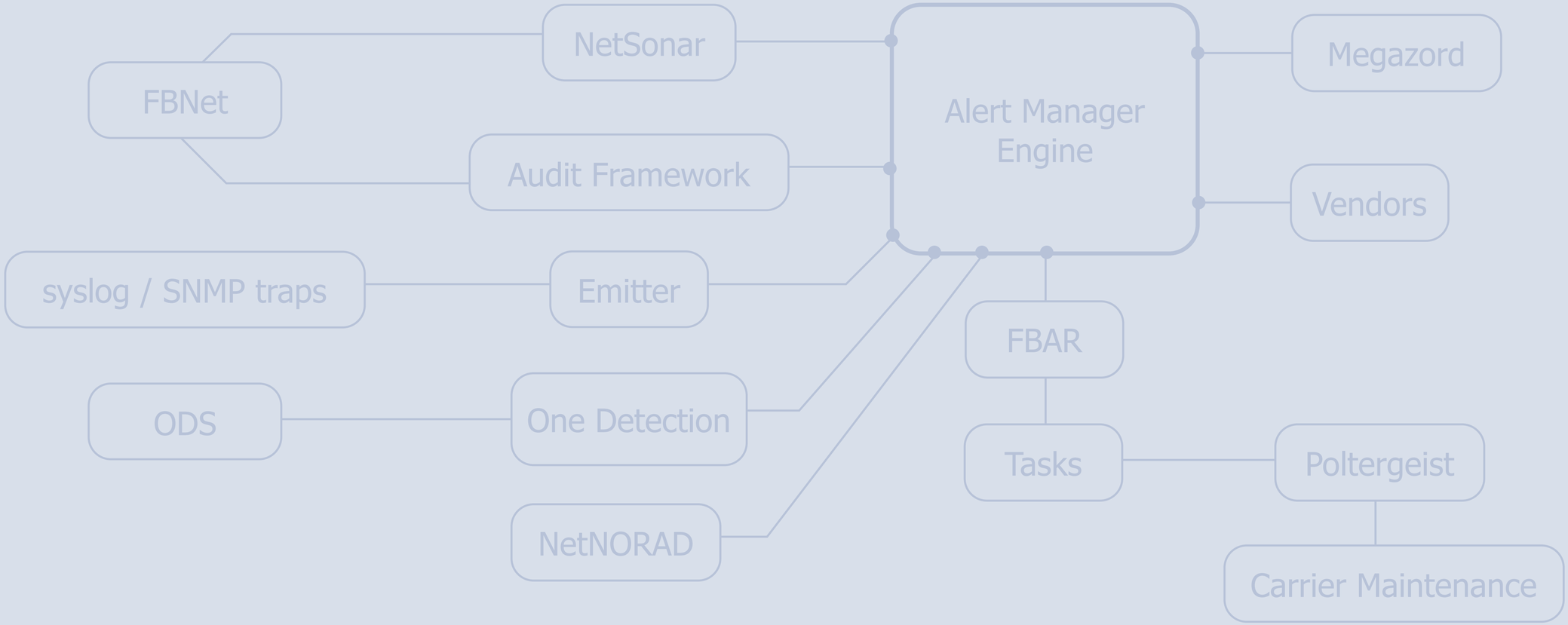
Facebook Defined Networking

all components in action



So, in 30 days...

all components in action



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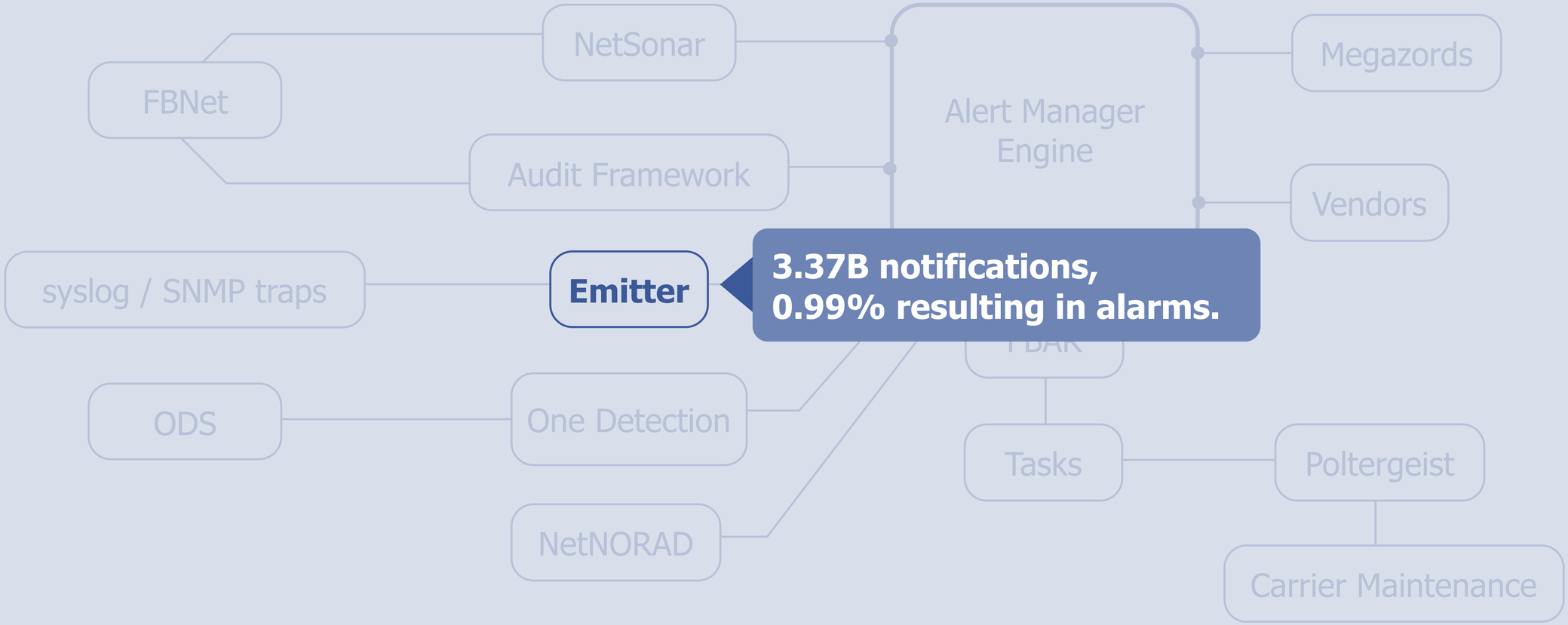

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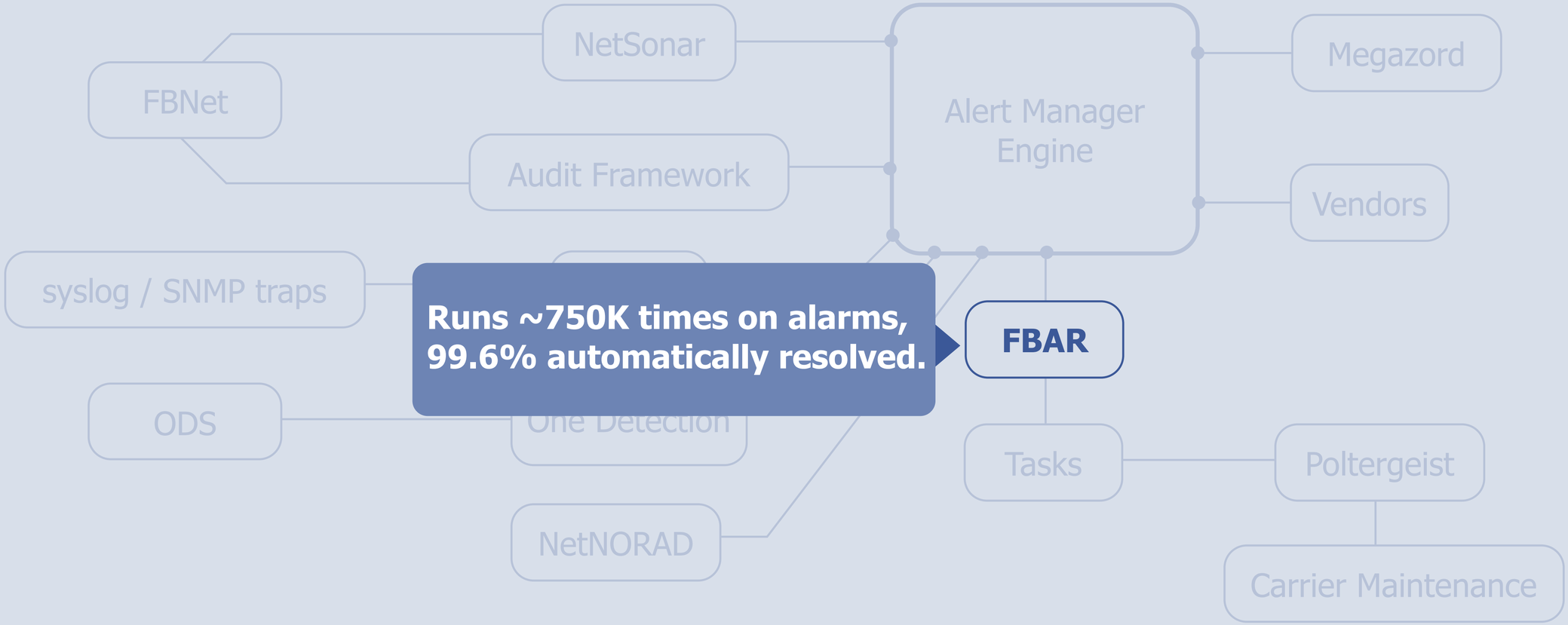

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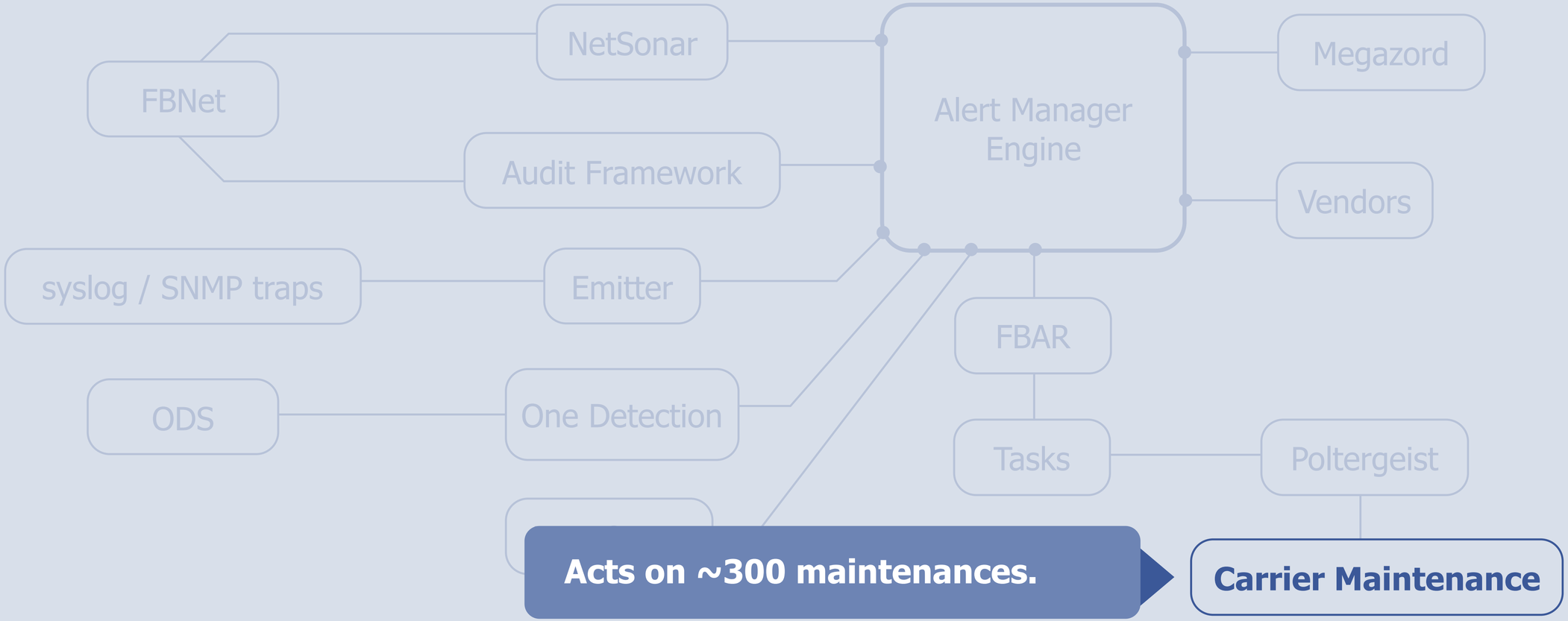

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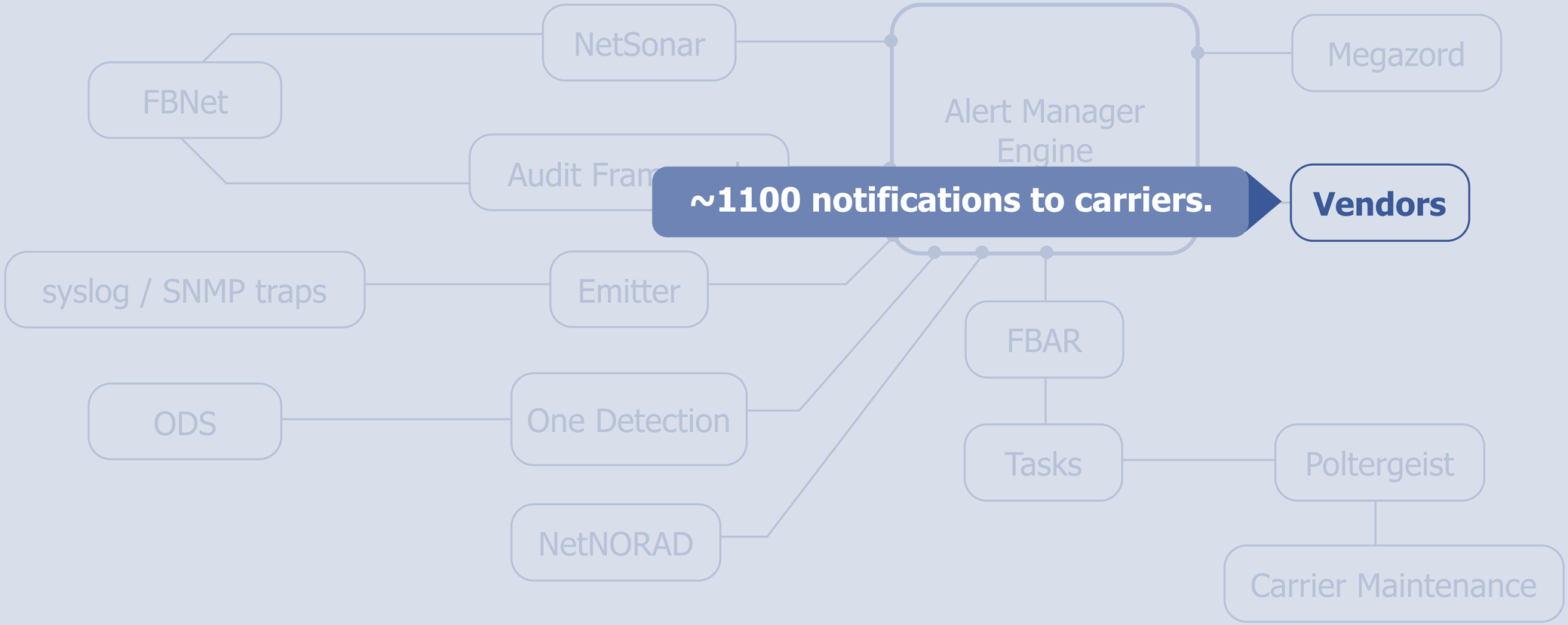

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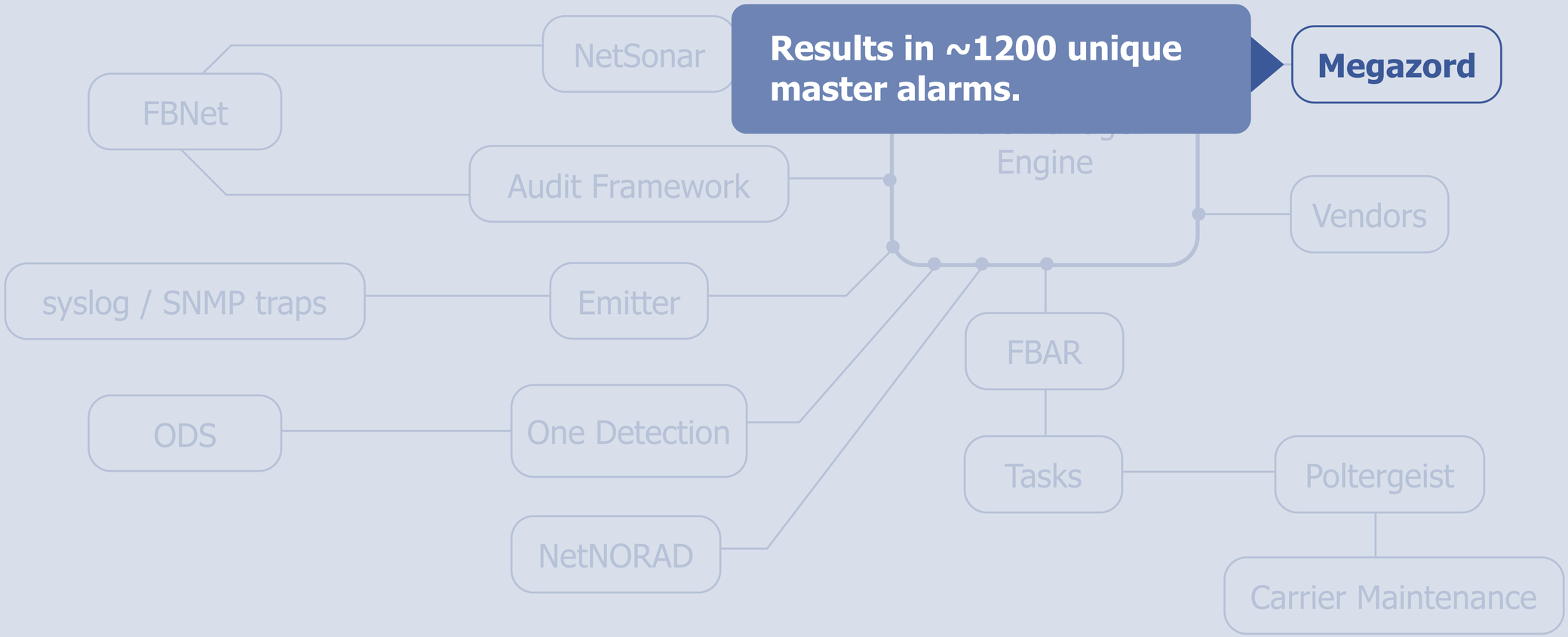
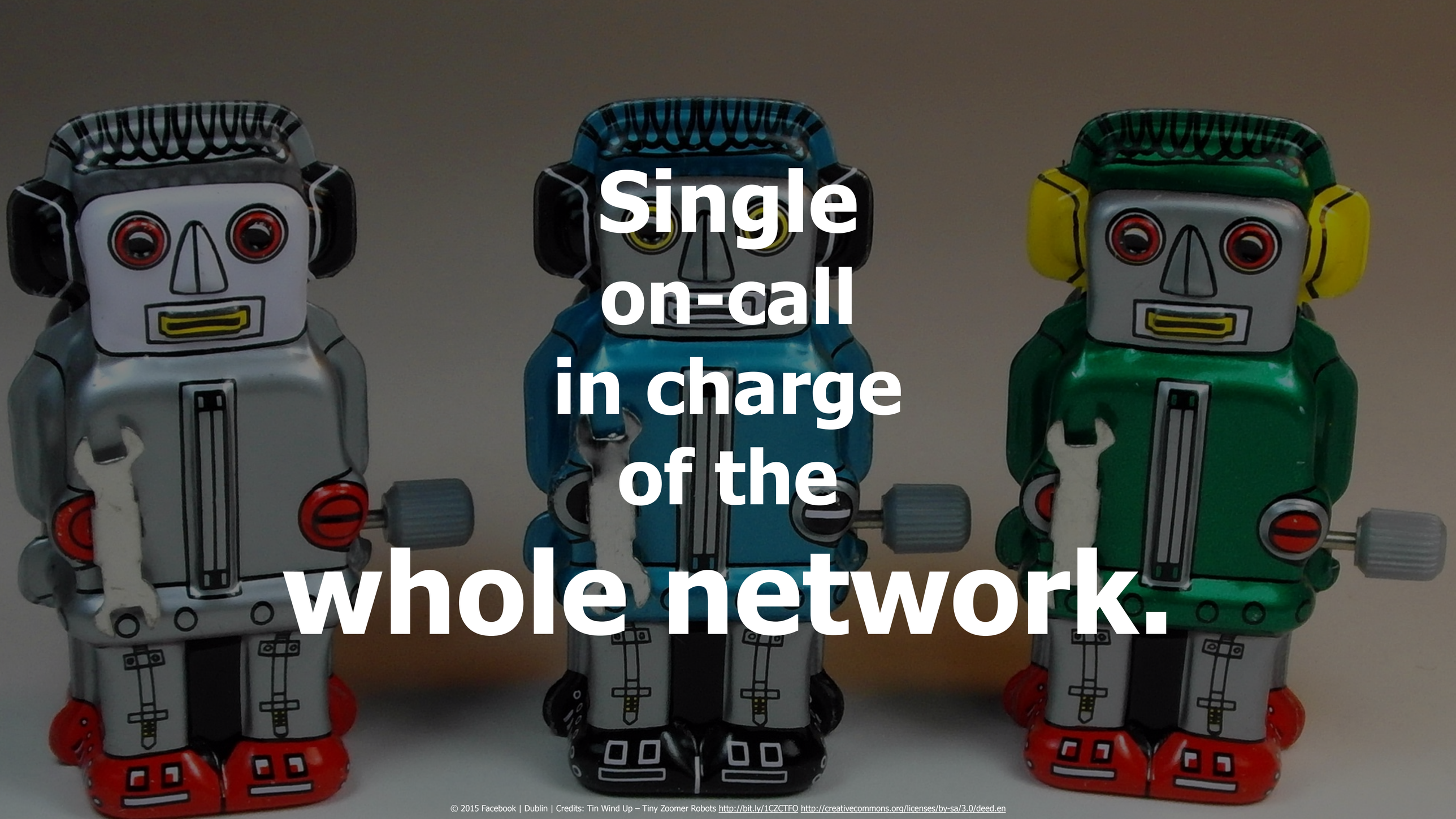
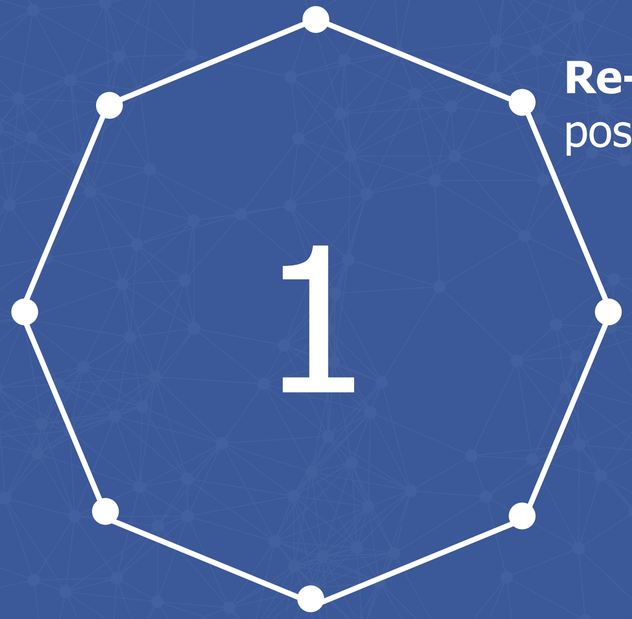




Lessons Learned & Recommendations

8 Lessons Learned & Recommendations



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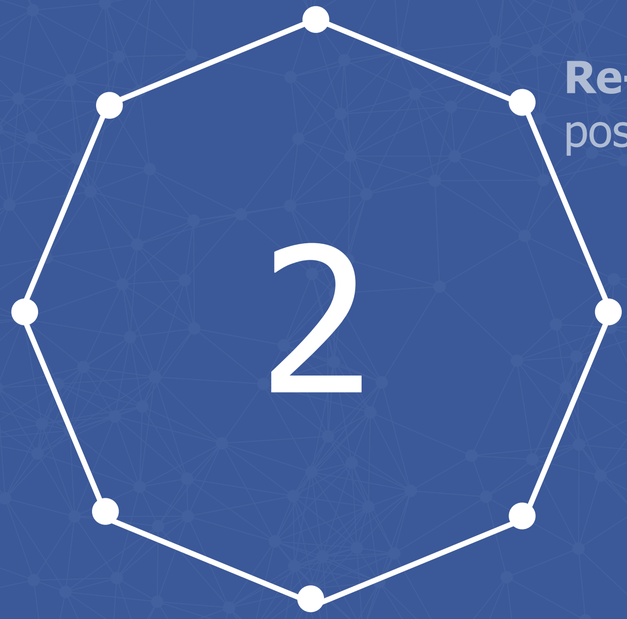

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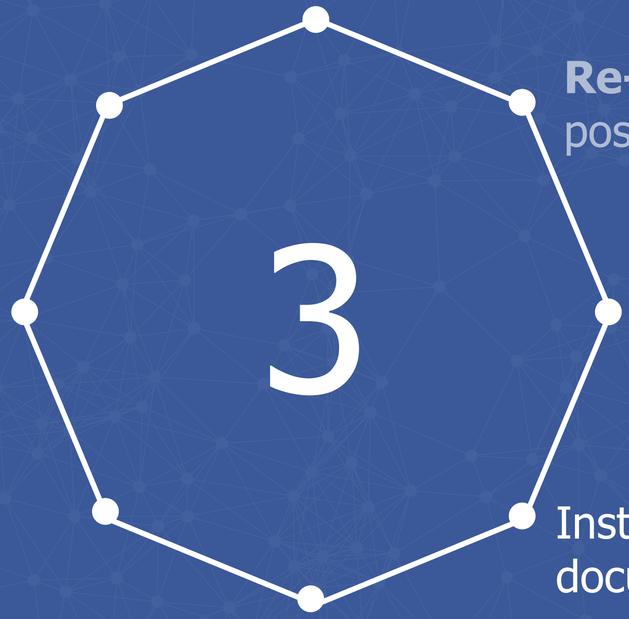

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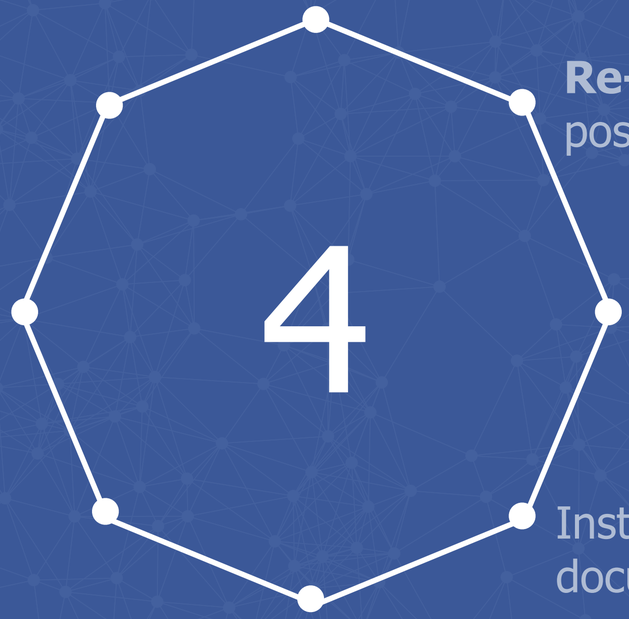

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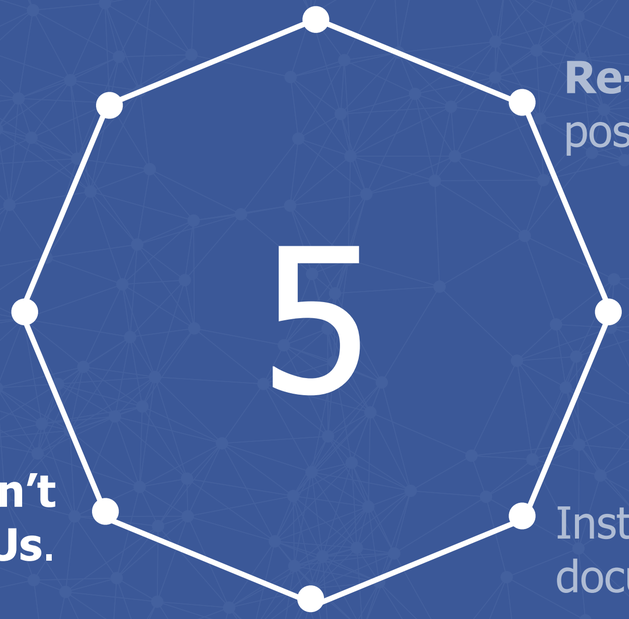

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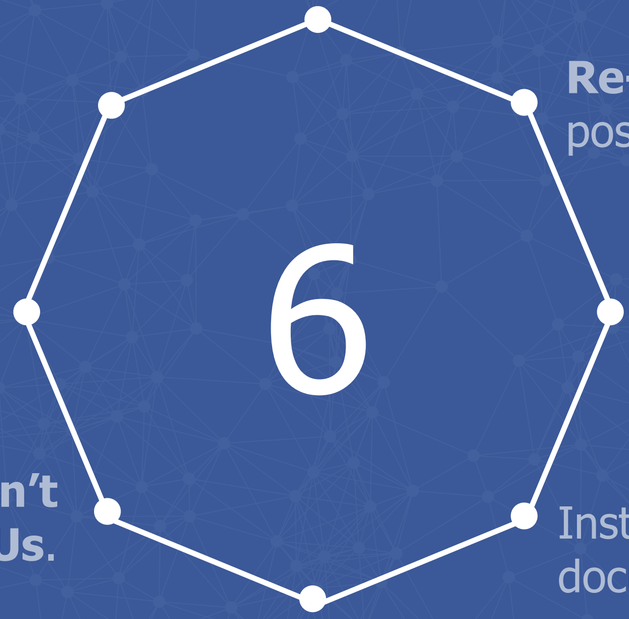

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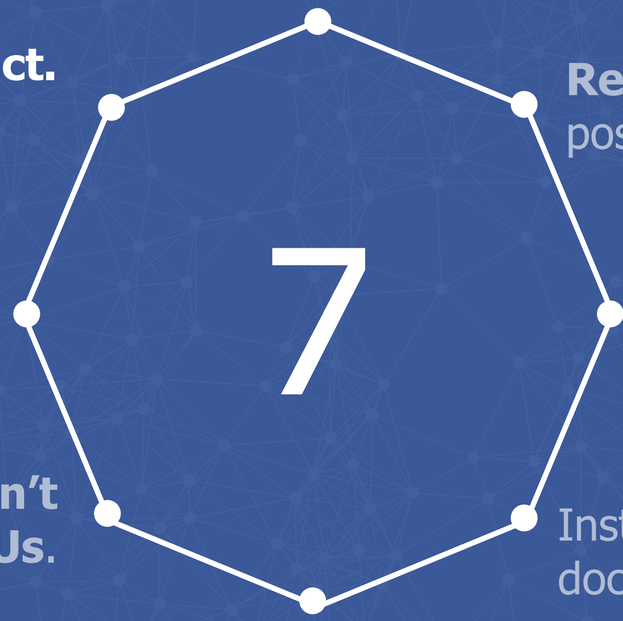

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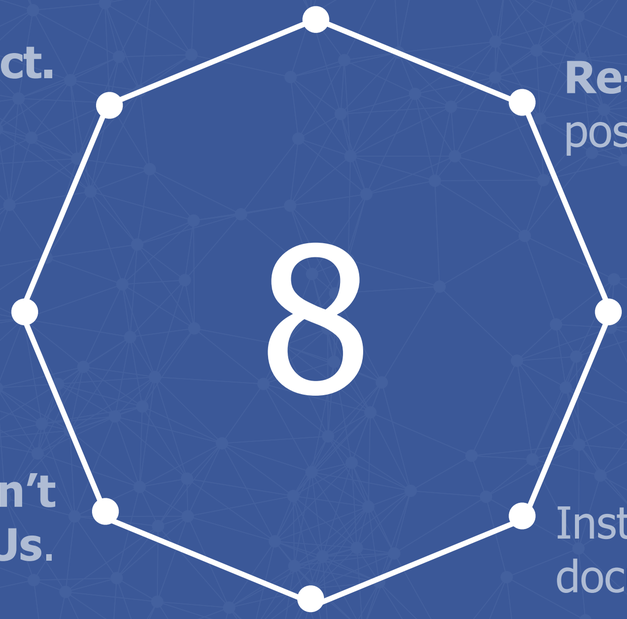

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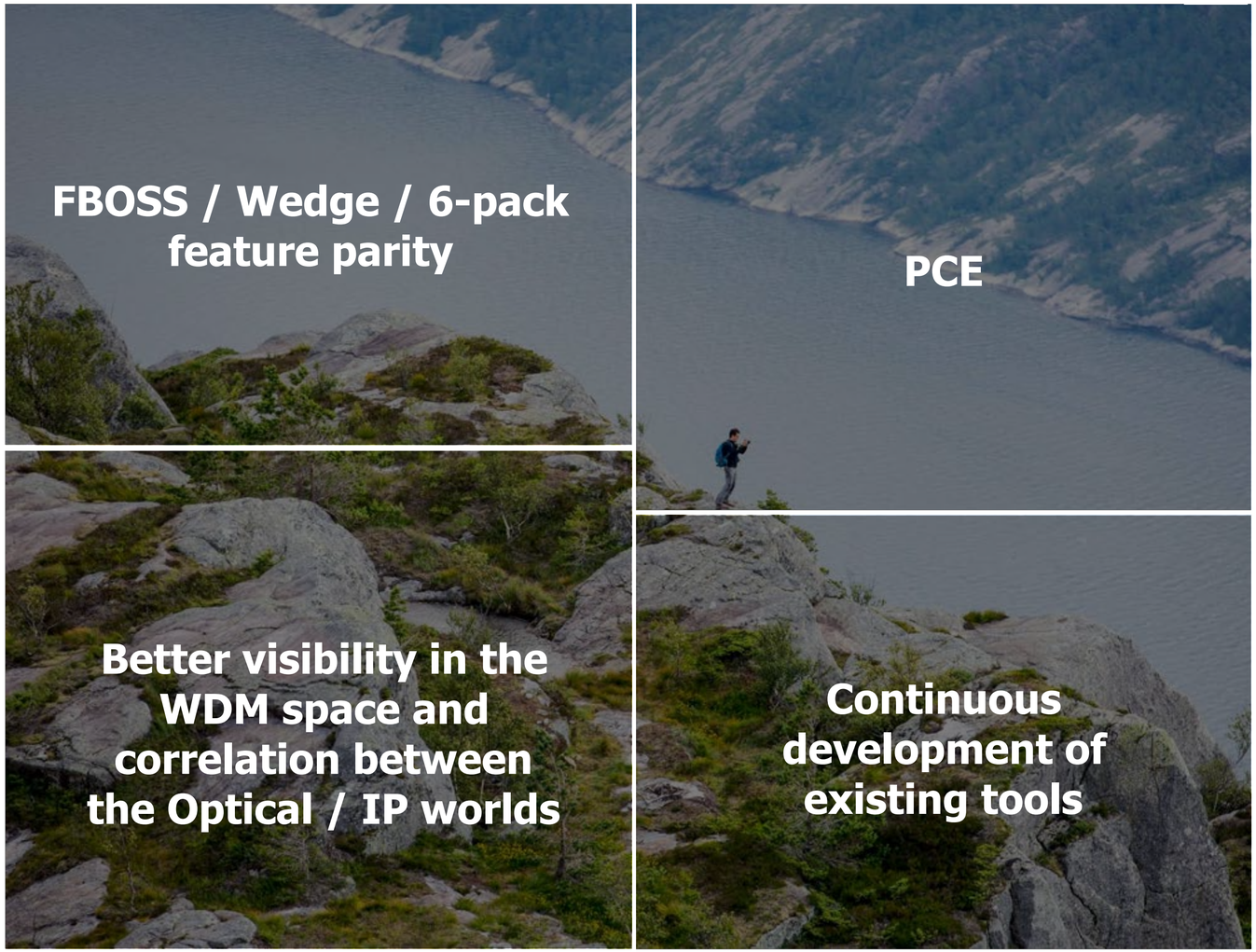
This journey is 1% finished

What's in the near future?

The journey is 1% finished



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```
import faster_detection
import faster_recovery
import less_stress

if network.is_automated:
    return ‘Relax’
else:
    Visit(‘#netengcode’)
```

WHAT WOULD YOU DO IF YOU WEREN'T AFRAID?

POSTER BROUGHT TO YOU BY YOUR FRIENDS AT  THE FACEBOOK ANALOG RESEARCH LABORATORY