Changing Network Detection

Using Bro and Distributed Computing Concepts

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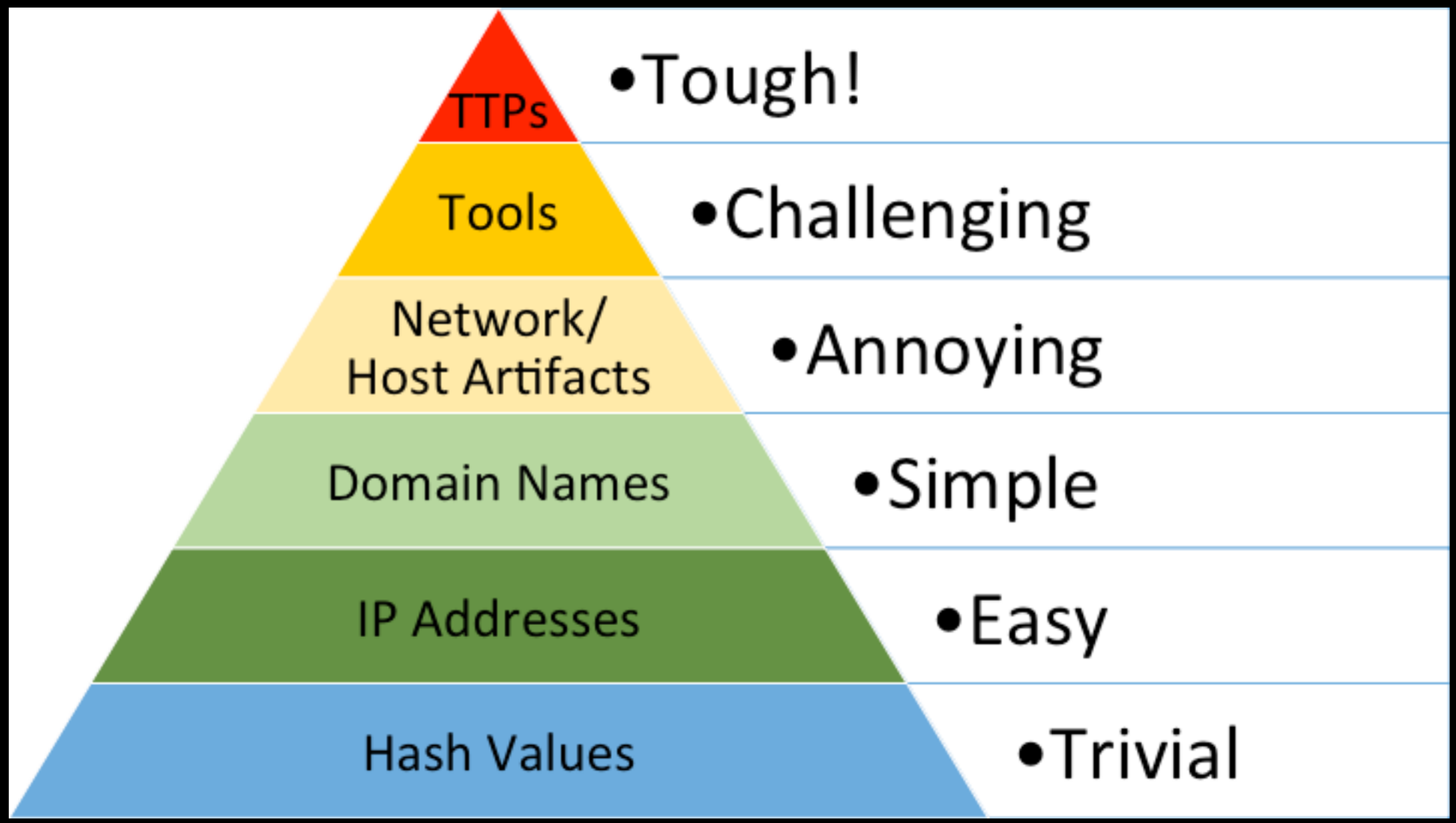
“Who are you and why are you talking to me?”

- 16 years in InfoSec, 19 years total IT
- Work at FireEye
- Huge Bro fan
- Lots of experience in large sensor deployments
- Heavily into RC stuff.. FPV, Autonomous flight etc
- Security Onion contributor - Onion Salt

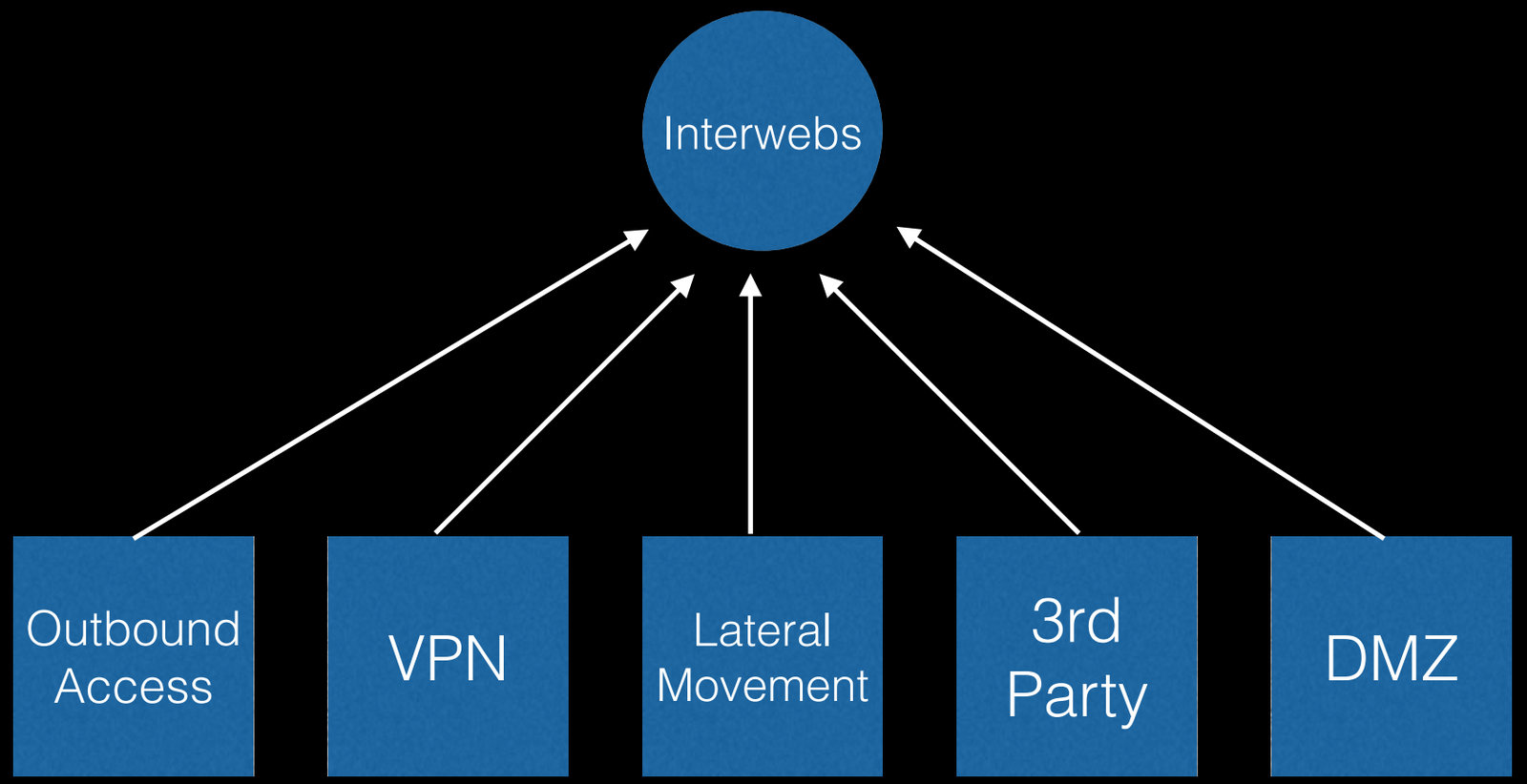
Story Time

Pyramid of Pain



*TM David Bianco

In Your Base


Interwebs
Outbound Access
VPN
Lateral Movement
3rd Party
DMZ

They know you better than you know yourself

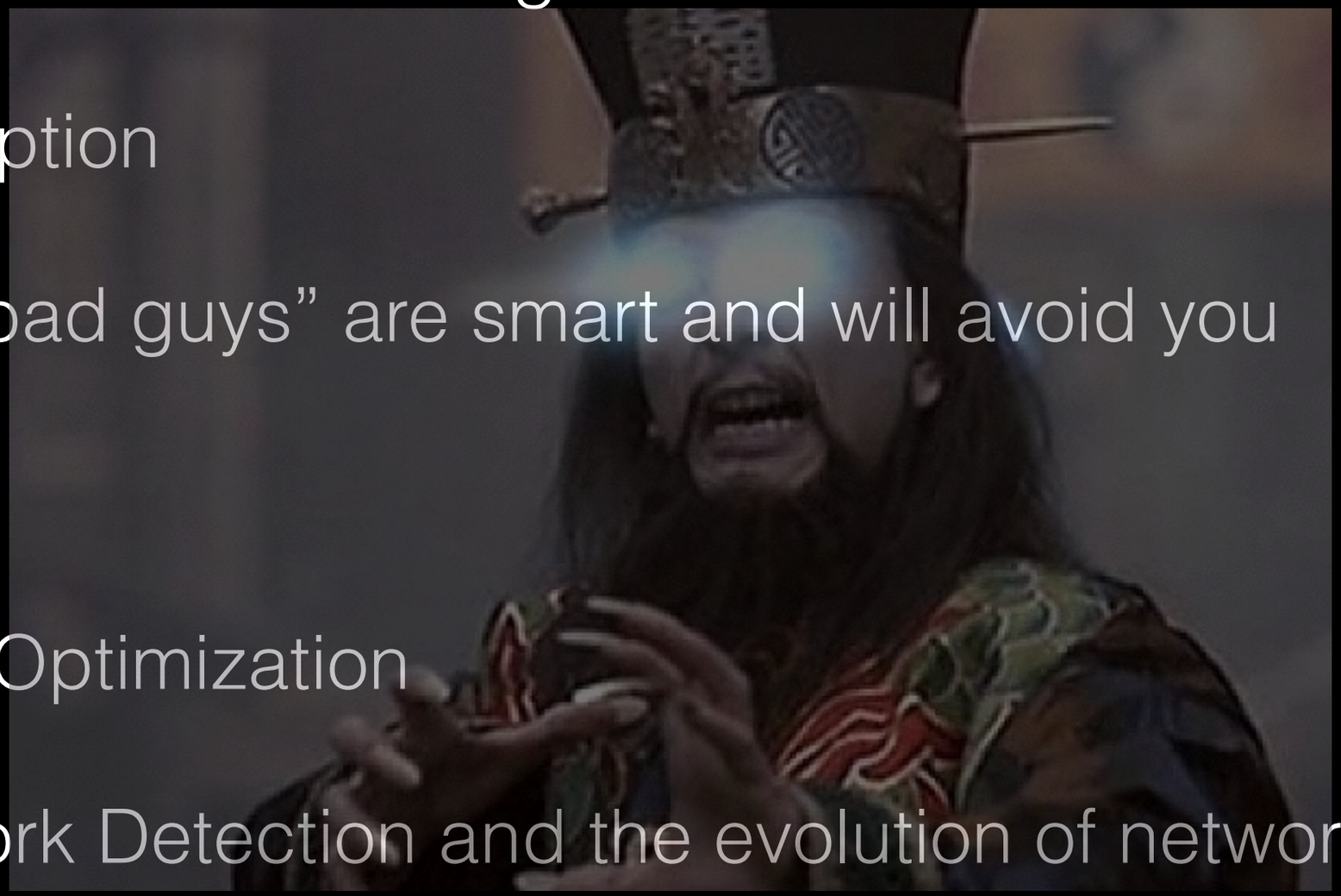
- You will always have critical data at the edge
- They know the typical value prop of network detection/prevention is to centralize
- So you will get hit where you are the weakest

Network Detection is Awesome

- Packets don’t lie for the most part
- You can snag malware pre-detonation
- Quick way to get some sort of detection to hosts on your network with minimal disruption
- Host based stuff only works on things you have it installed on

Big Trouble in Little China

- Asynchronous Routing
- Encryption
- The “bad guys” are smart and will avoid you
- MPLS
- WAN Optimization
- Network Detection and the evolution of networking are in direct conflict



A”stink”ronous Routing

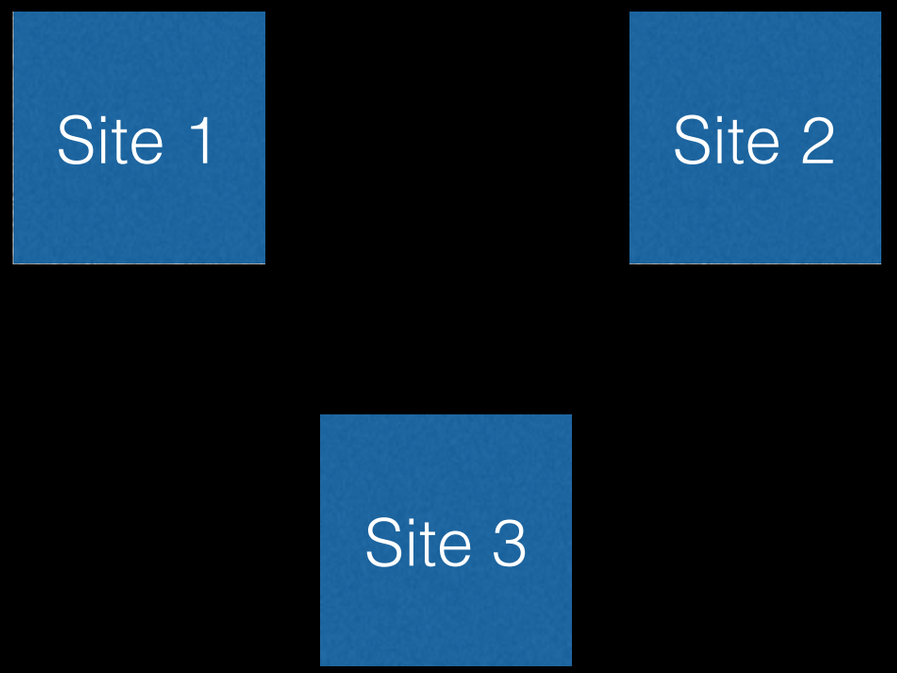
- Thanks BGP!
- The reality is you are going to hit this no matter what you do
- You should be doing asynchronous routing to improve network performance - just sucks for people trying to do detection

Encryption

- You are screwed for the most part
- Use SSL termination devices and put your sensors behind those
- There are commercial MITM products you can get some stuff out of
- Still screwed though

MPLS

- Network teams want to use MPLS the right way
- There is a lot of “hub and spoke” configurations still to centralize traffic for detection needs
- This ends up costing more money



WAN Optimization

- Cool concept and can save money
- Jacks up your detection capabilities since it only sends part of the traffic once its been accelerated
- Requires a sensor on the unoptimized side

I have told you everything that sucks. What should we do?

Time to flip detection on its head!

No more whiz bangery

- Choke points and the evolution of networking are in direct conflict
- If indicators are good enough for your sensors its good enough for everything
- Flexibility is the most important part of an effective detection strategy
- There is no “shiny and chrome” fix

How do we fix this?

- Go where the users are.. That is what the bad guys do
- Networks are distributed - so should your detection
- This means lots of Bro devices in lots of places
- Let’s steal some concepts from distributed computing

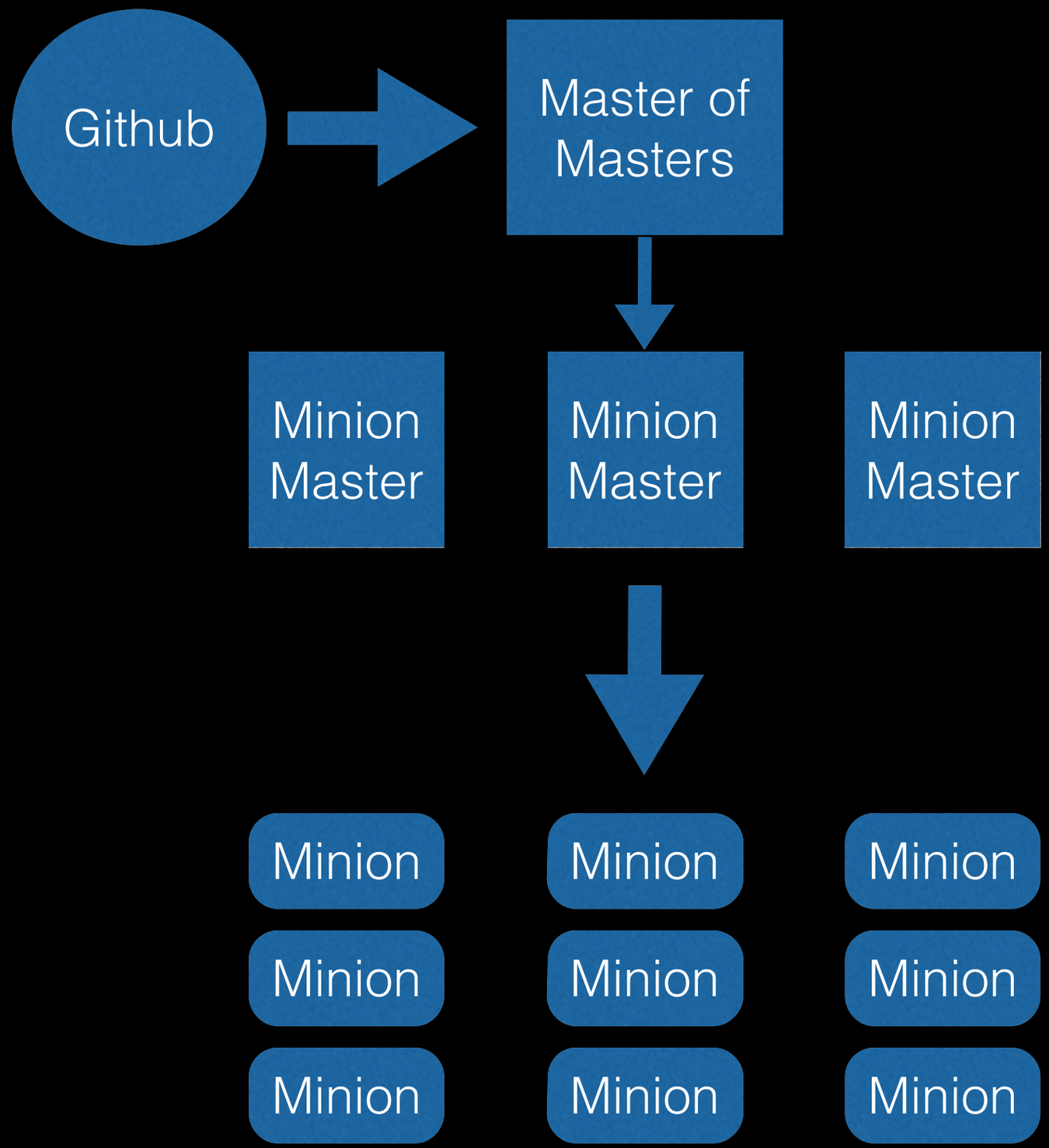
Introducing the double decker couch

- We use sensors for their resources.. like worker nodes in a HPC
- Workers can be rebuilt within minutes
- Should be able to run on whatever hardware is around
- The entire grid should be managed as a single device

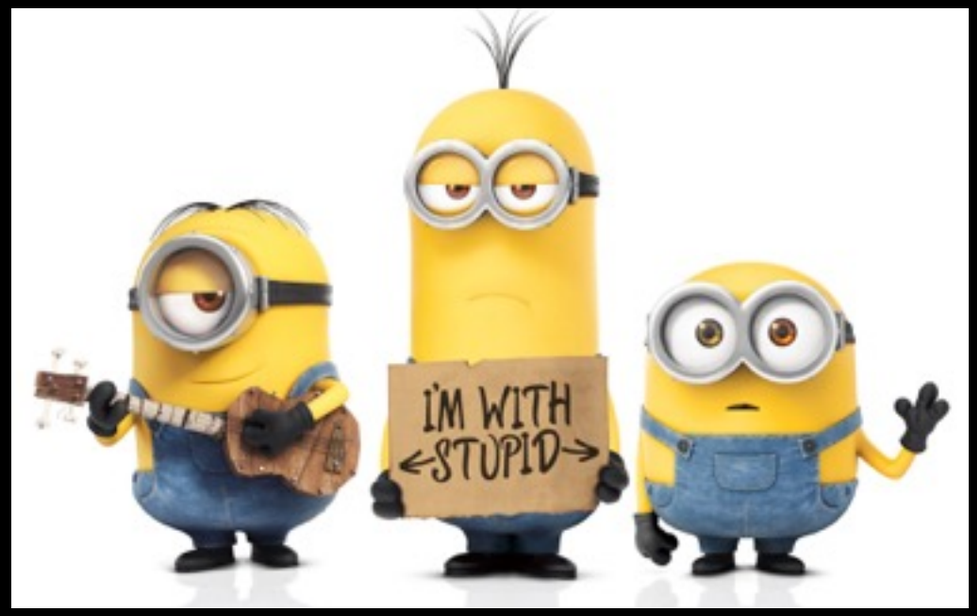
How do we do this? By making our Bro sensors dumb!

- Pull off as much as possible
- No more atomic indicators on sensors
- Sensors are there to provide data to the backend
- Use low power devices

Master Minion Architecture



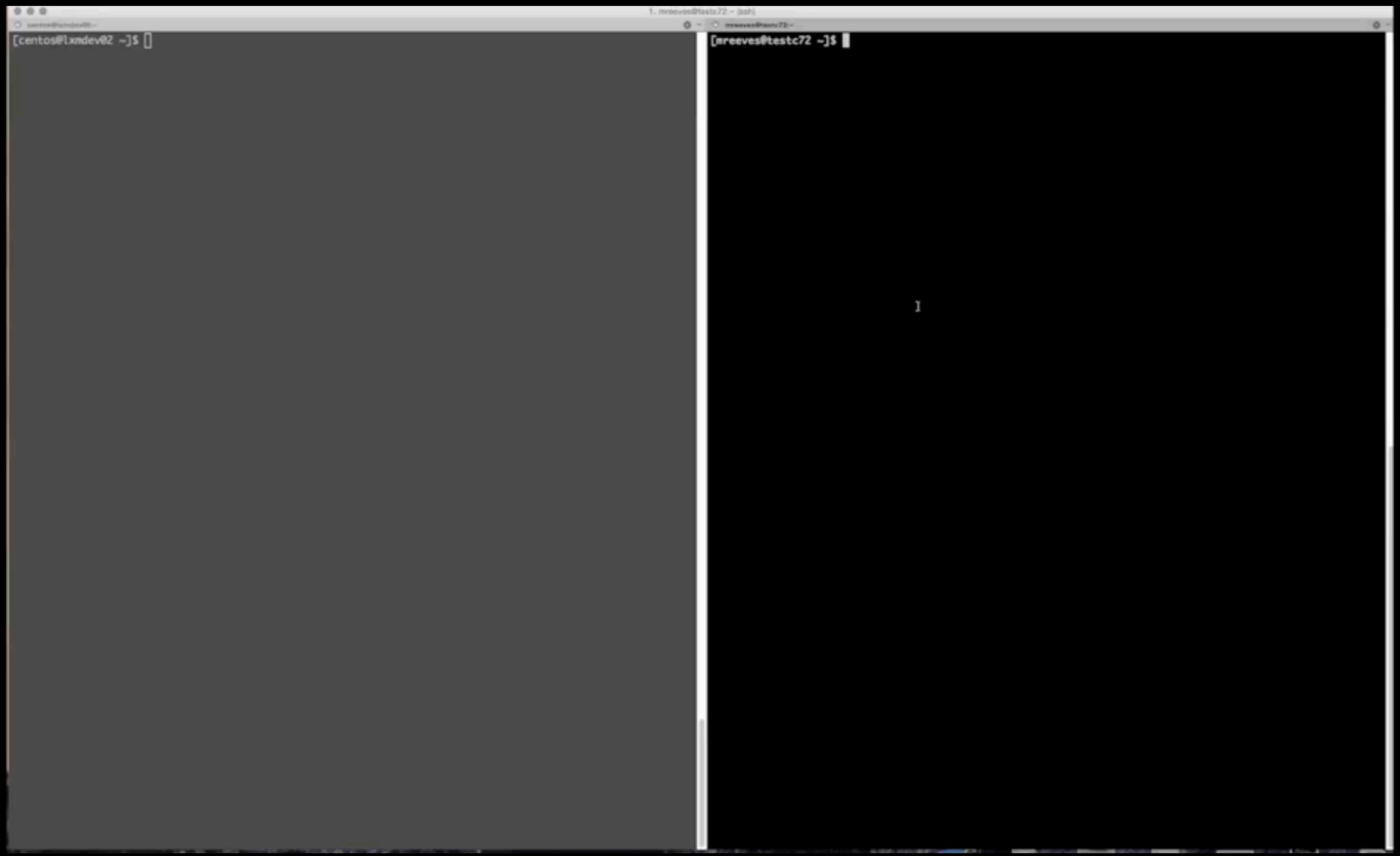
Minions work for their Masters



- Minions check in on a predetermined timeframe to ensure all things are like they are supposed to be

- This allows us to have a single config for thousands of devices

Demo Time



That's neat.. But how do I detect stuff

- Break things into a service based architecture
- This makes scaling these services possible
- Forces data to be centralized instead of devices
- Puts the horsepower to detect lots of evil where its easy to scale vs sensors have finite resources
- Still need "deep packet inspection" to run on the sensors

Pub-sub to the rescue

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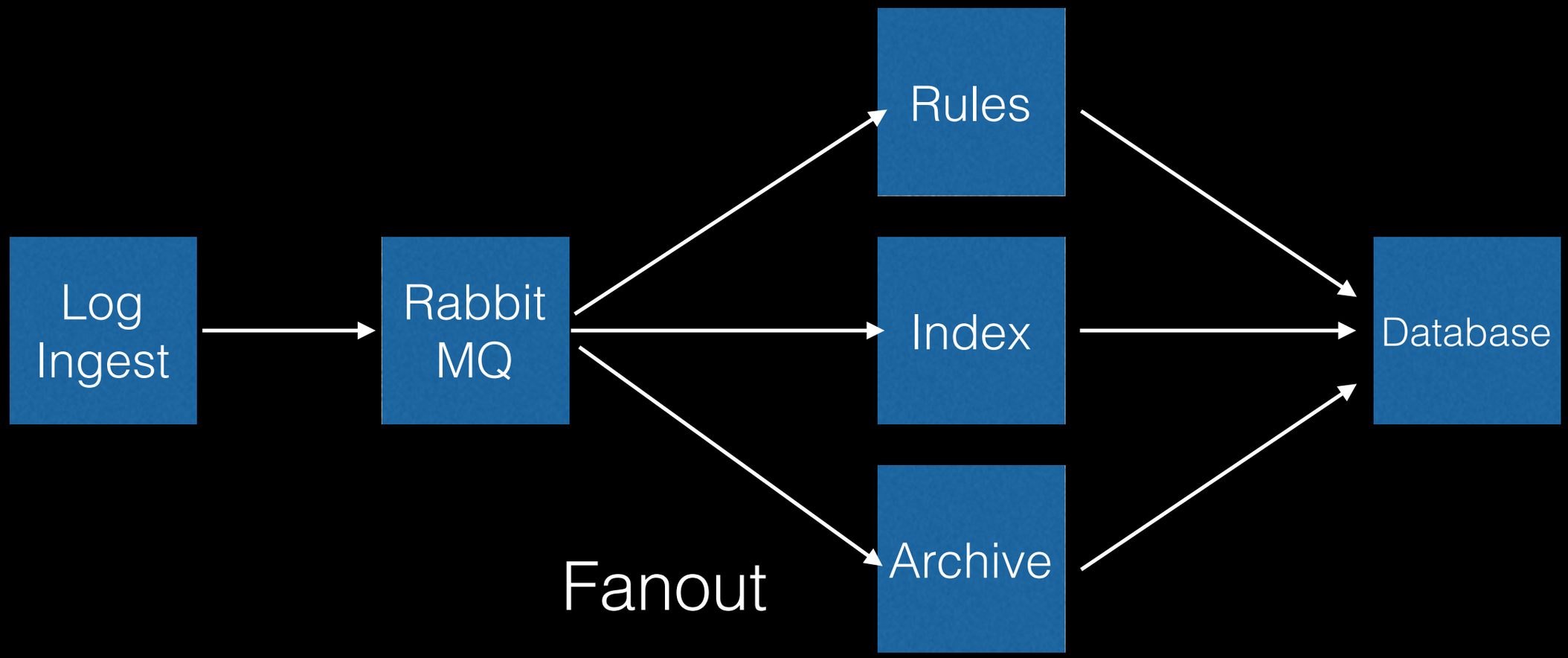
- Ship bro logs from the sensors into some sort of Pub-Sub architecture. ex. REDIS, RabbitMQ
- Make subscribers process the log files looking for your indicators
- Expensive rules mean more work not lost packets

Sample Architecture

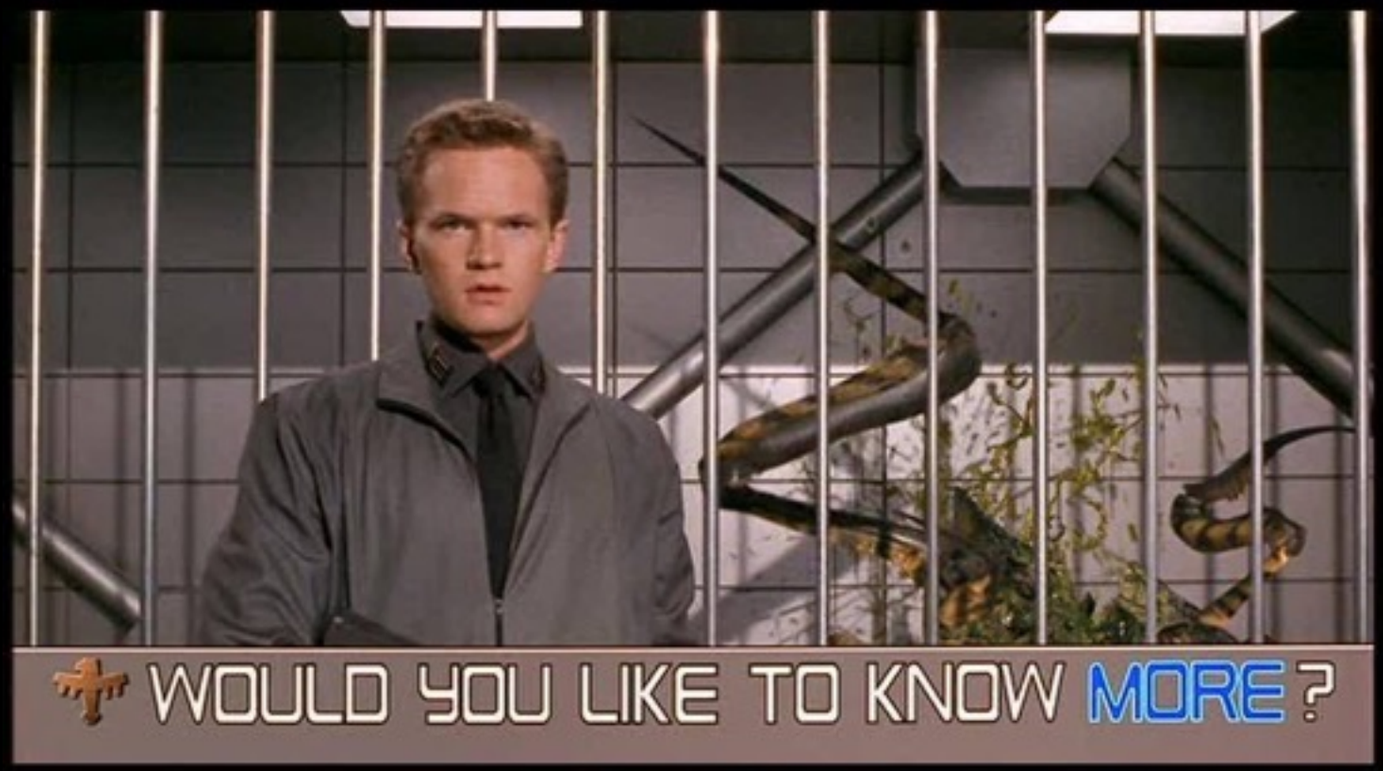


You mean I can use logs too?

- Atomic indicators work great on all kinds of different logs
- IP Adresses: bro_conn, firewall logs, proxy logs, webserver logs,host logs
- URI/URL: bro_http, proxy logs, web server logs
- Domains: bro_dns, dns logs, proxy logs, host logs

ESM

Enterprise Security Monitoring



- David Bianco BSides Augusta 2013
- https://www.youtube.com/watch?v=gA65N-RSWQ0
- @DavidJBianco

What did we improve?

- MPLS can be used as intended. No more hub and spoke
- Asynchronous routing is no longer as much of an issue since we are closer to the users
- Ability to get traffic before it is optimized
- Gives you more eyes in more places to detect lateral movement

Questions?