

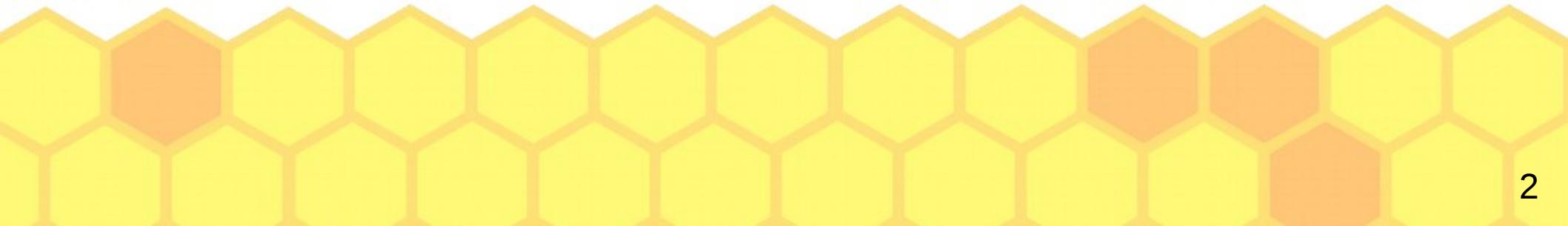


# draft-richardson-secdispatch-idevid- considerations-02

## IETF108 – secdispatch - 2020-07-30

Michael Richardson <[mcr+ietf@sandelman.ca](mailto:mcr+ietf@sandelman.ca)>  
Jay Yang <[jay.yang@huawei.com](mailto:jay.yang@huawei.com)>

1972



# 1972



My Dad (cjr)  
[Sociologist!]

# 1972



My Dad (cjr)  
[Sociologist!]



Returned from UK

# 1972



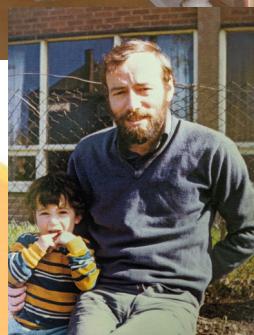
My Dad (cjr)  
[Sociologist!]



Returned from UK



With  
Baby Boy (mcr)



# 1972



My Dad (cjr)  
[Sociologist!]



Returned from UK

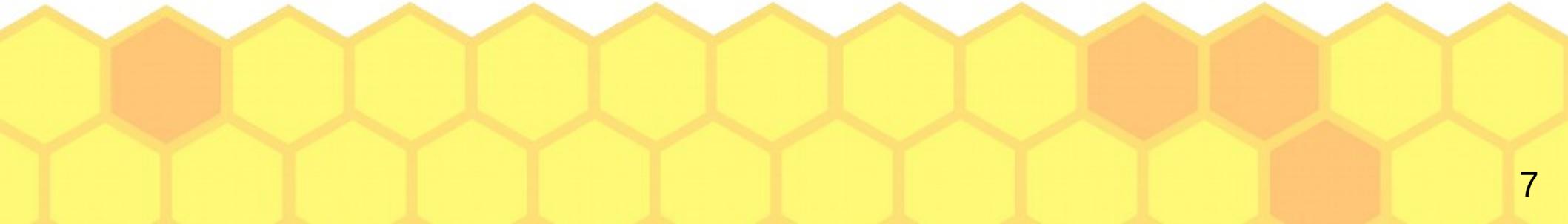


With  
Baby Boy (mcr)



Alpha version of  
SPSS: Statistical  
Package for the  
Social Sciences

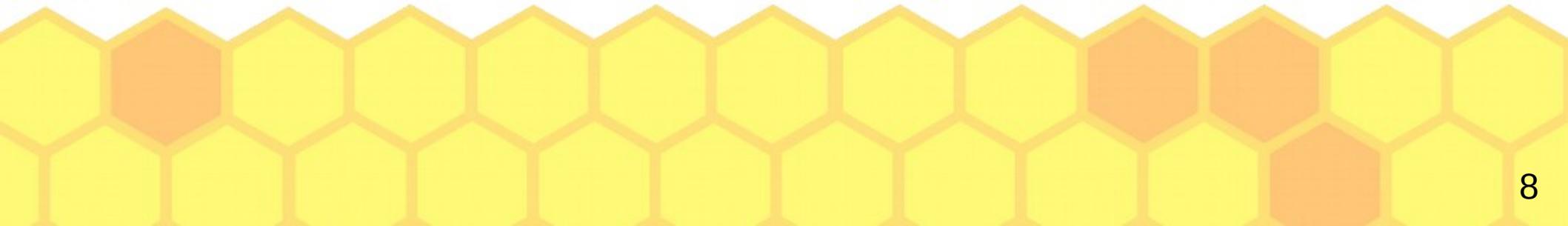
# 1975



# 1975



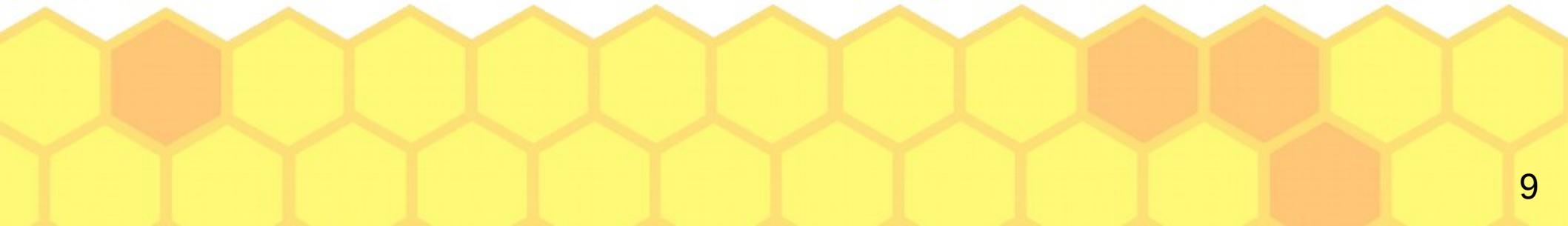
Got a “computer”



# 1975



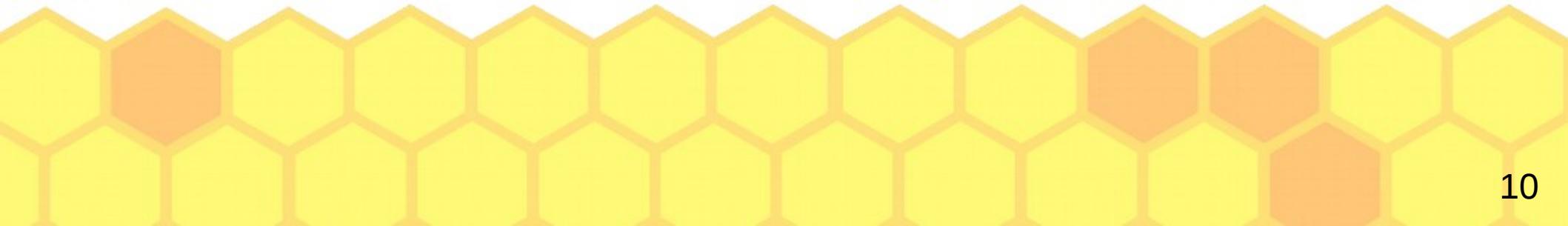
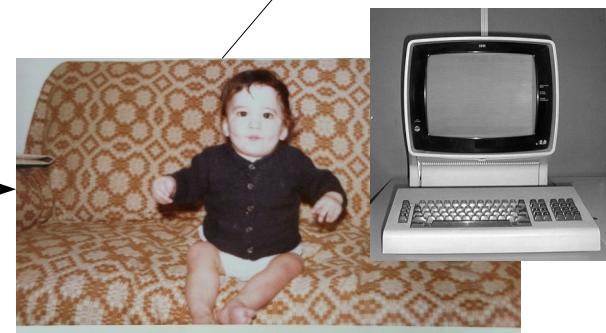
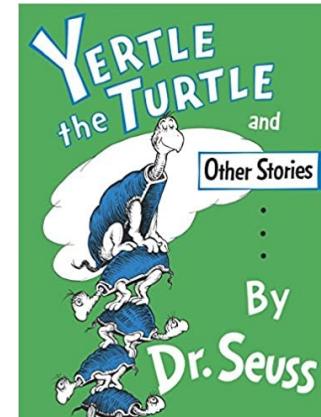
Got a “computer”



# 1975



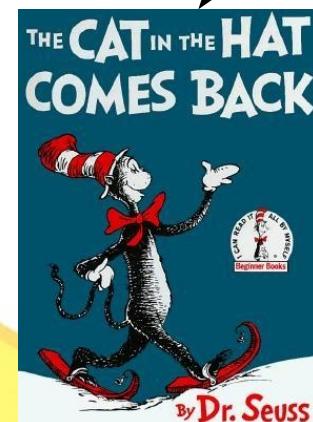
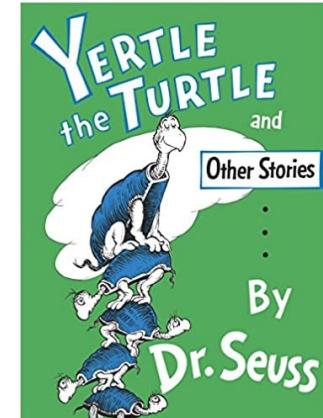
Got a “computer”



# 1975



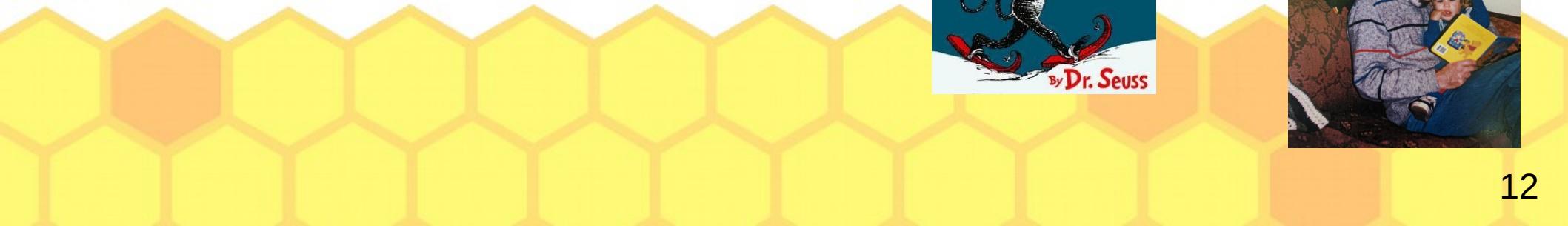
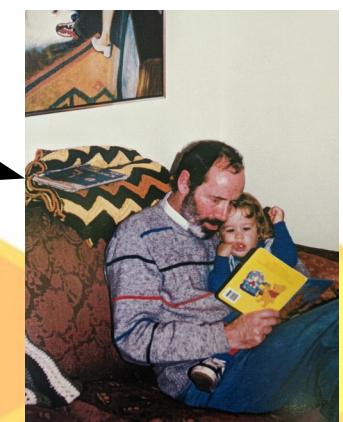
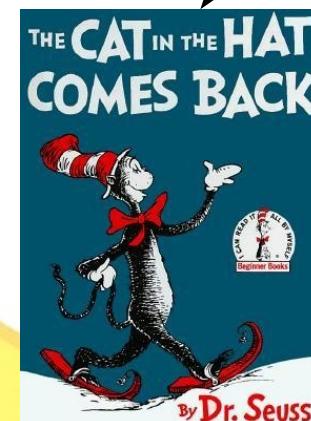
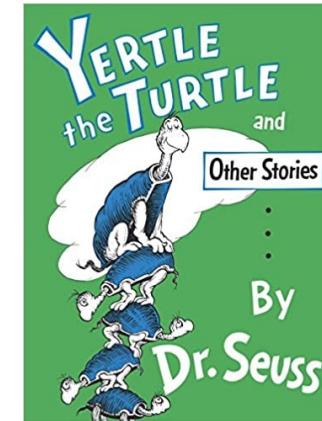
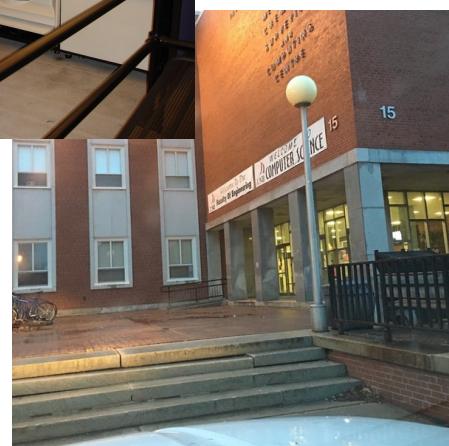
Got a “computer”



# 1975



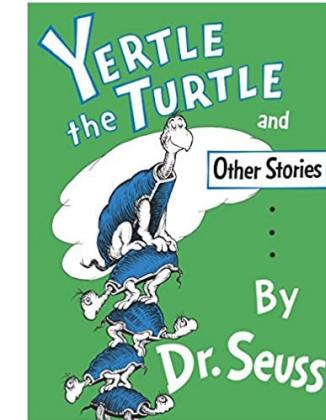
Got a “computer”



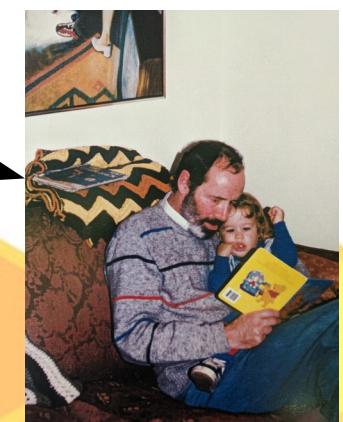
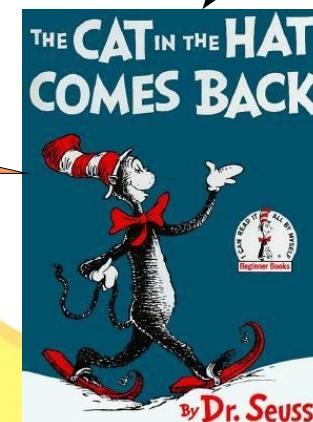
# 1975



Got a “computer”



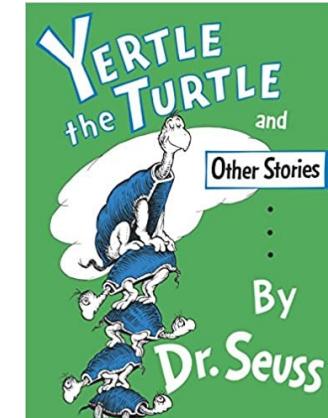
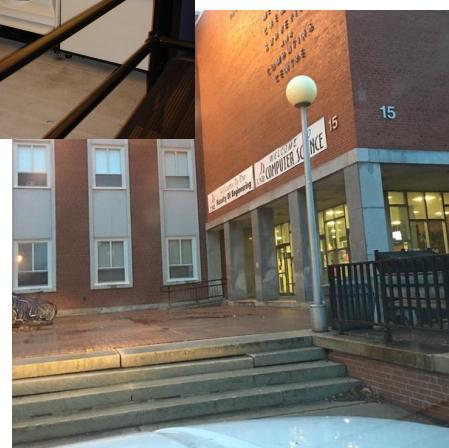
And we read  
An awful lot



# 1975

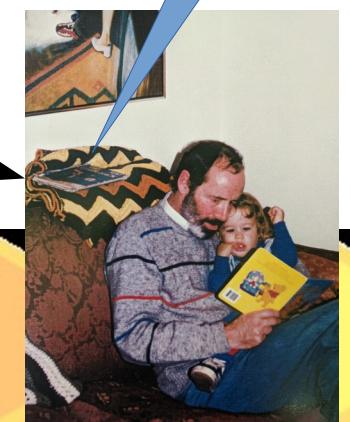
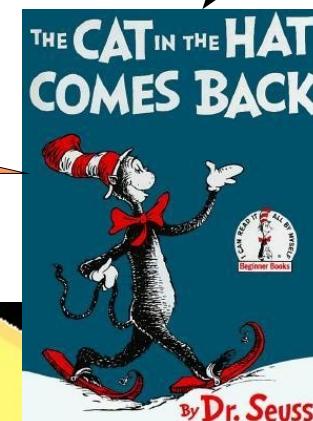


Got a “computer”

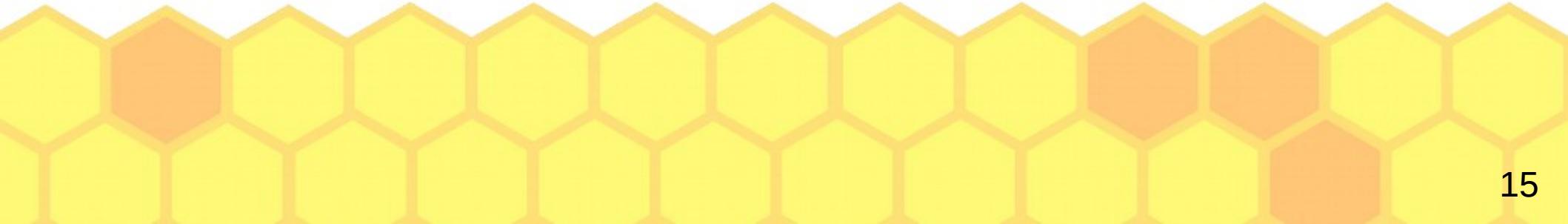


Worn Out copy

And we read  
An awful lot

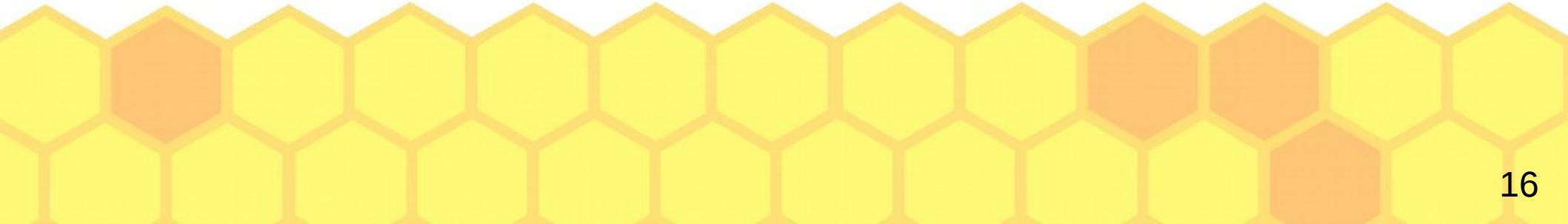


1995: for decades, he had been  
pestering me:



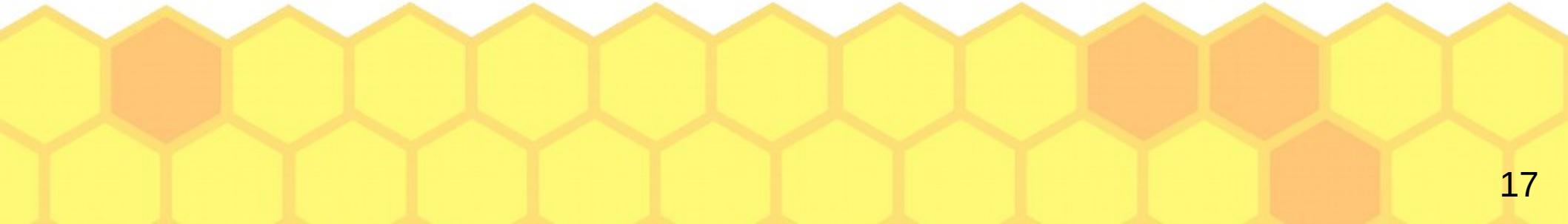
# 1995: for decades, he had been pestering me:

HOW DOES MY COMPUTER KNOW



# 1995: for decades, he had been pestering me:

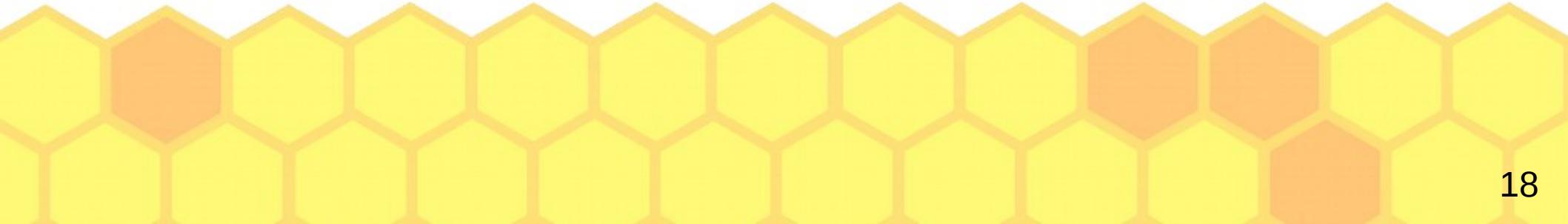
HOW DOES MY COMPUTER KNOW  
WHAT TO DO WHEN I TURN IT ON?



# 1995: for decades, he had been pestering me:

HOW DOES MY COMPUTER KNOW  
WHAT TO DO WHEN I TURN IT ON?

*HOW DOES IT KNOW IT WHO IT CAN TRUST?*



# 1995: for decades, he had been pestering me:

HOW DOES MY COMPUTER KNOW  
WHAT TO DO WHEN I TURN IT ON?

*HOW DOES IT KNOW IT WHO IT CAN TRUST?*

Me, explaining  
What a BIOS is

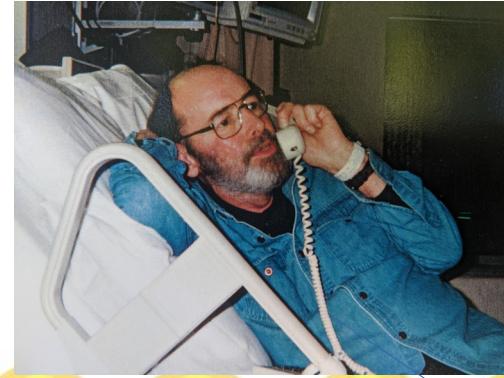
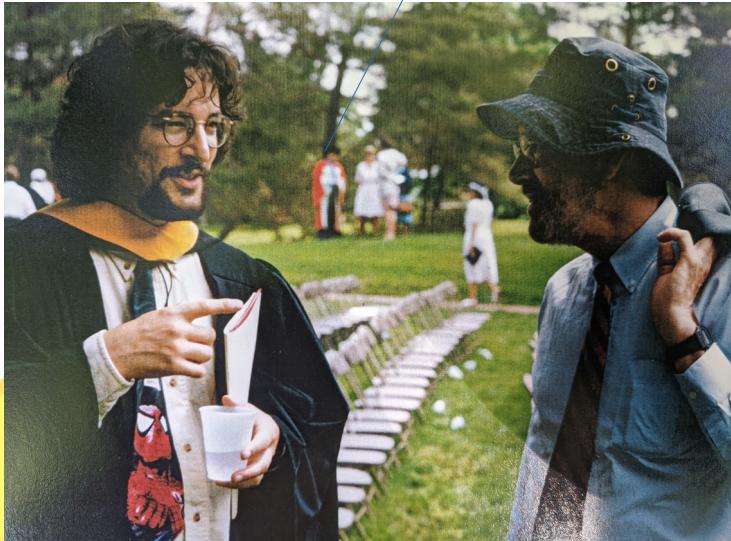


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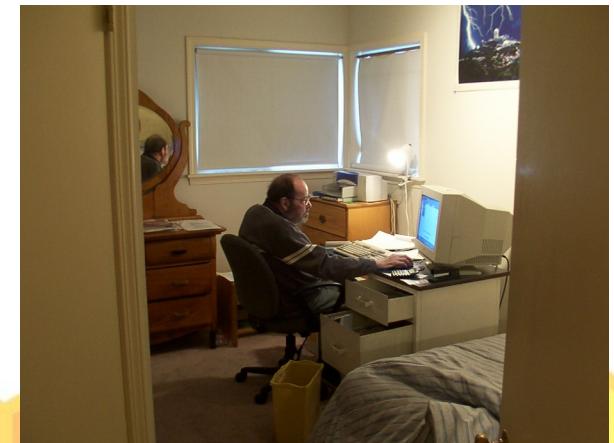
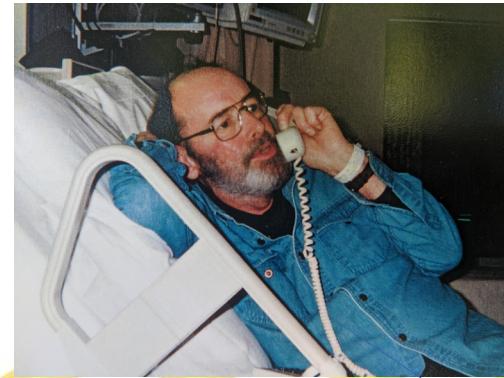
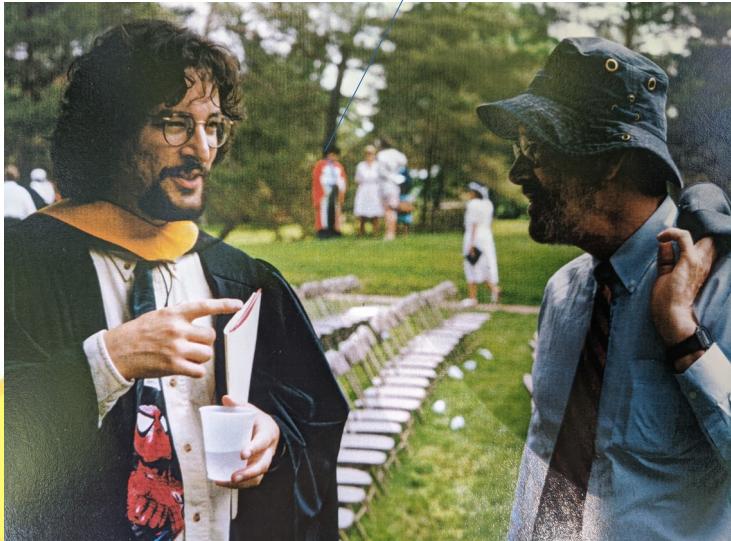
“So, does every  
IoT device have  
a secure enclave?”

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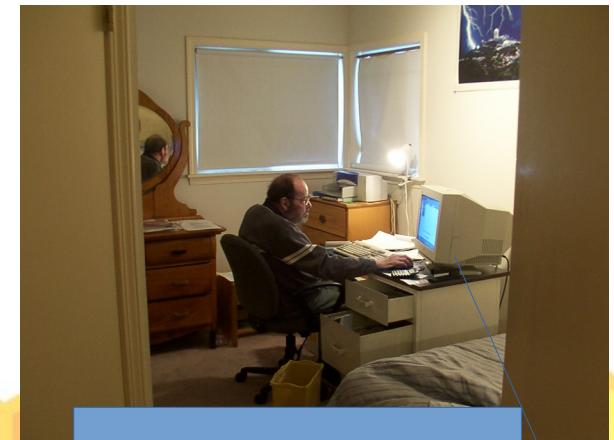
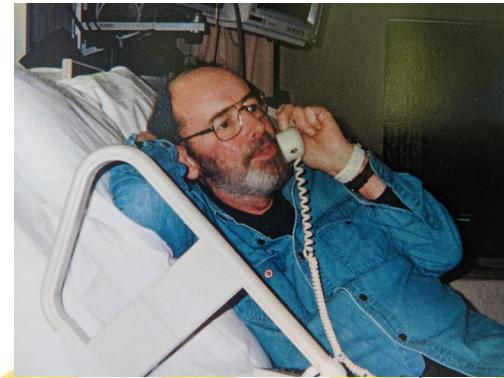
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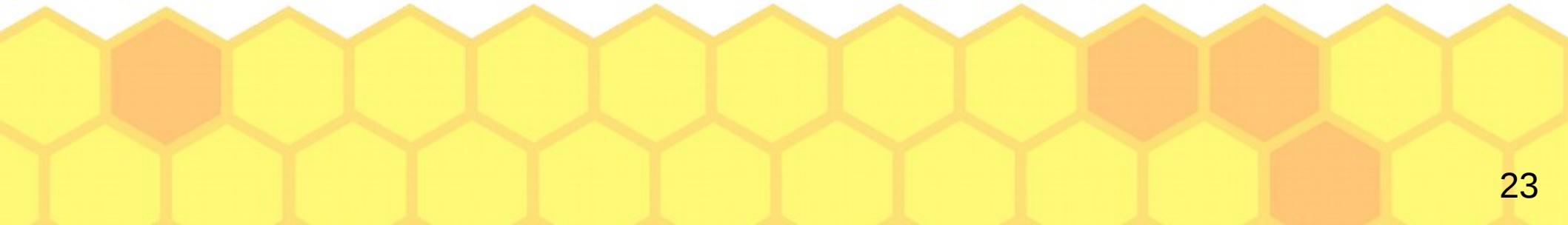


“So, does every  
IoT device have  
a secure enclave?”

“No, I don’t want  
to securely update  
right now!!”

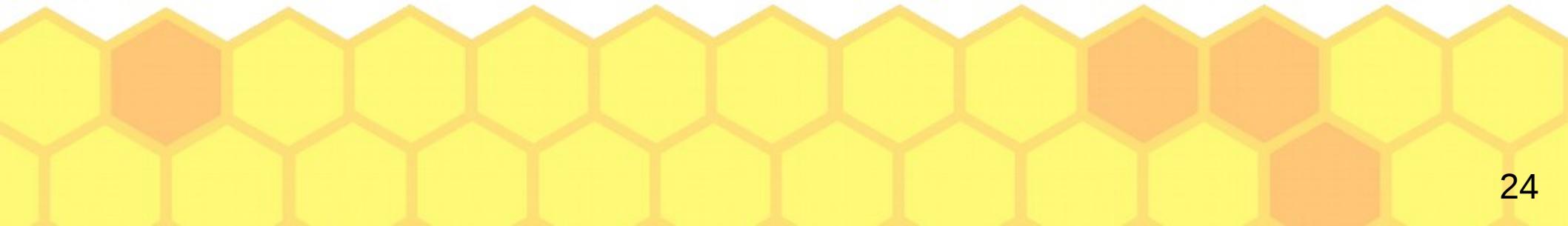
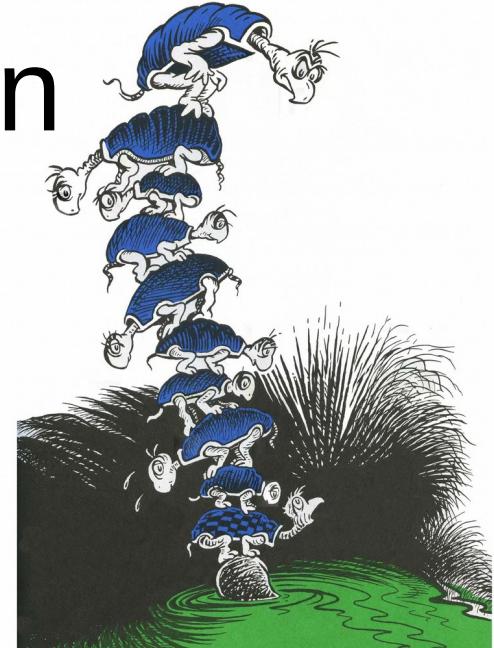
# Turtles all the way down

- Everytime I thought I'd convinced him, he'd just just complain:
  - You've just added a turtle.



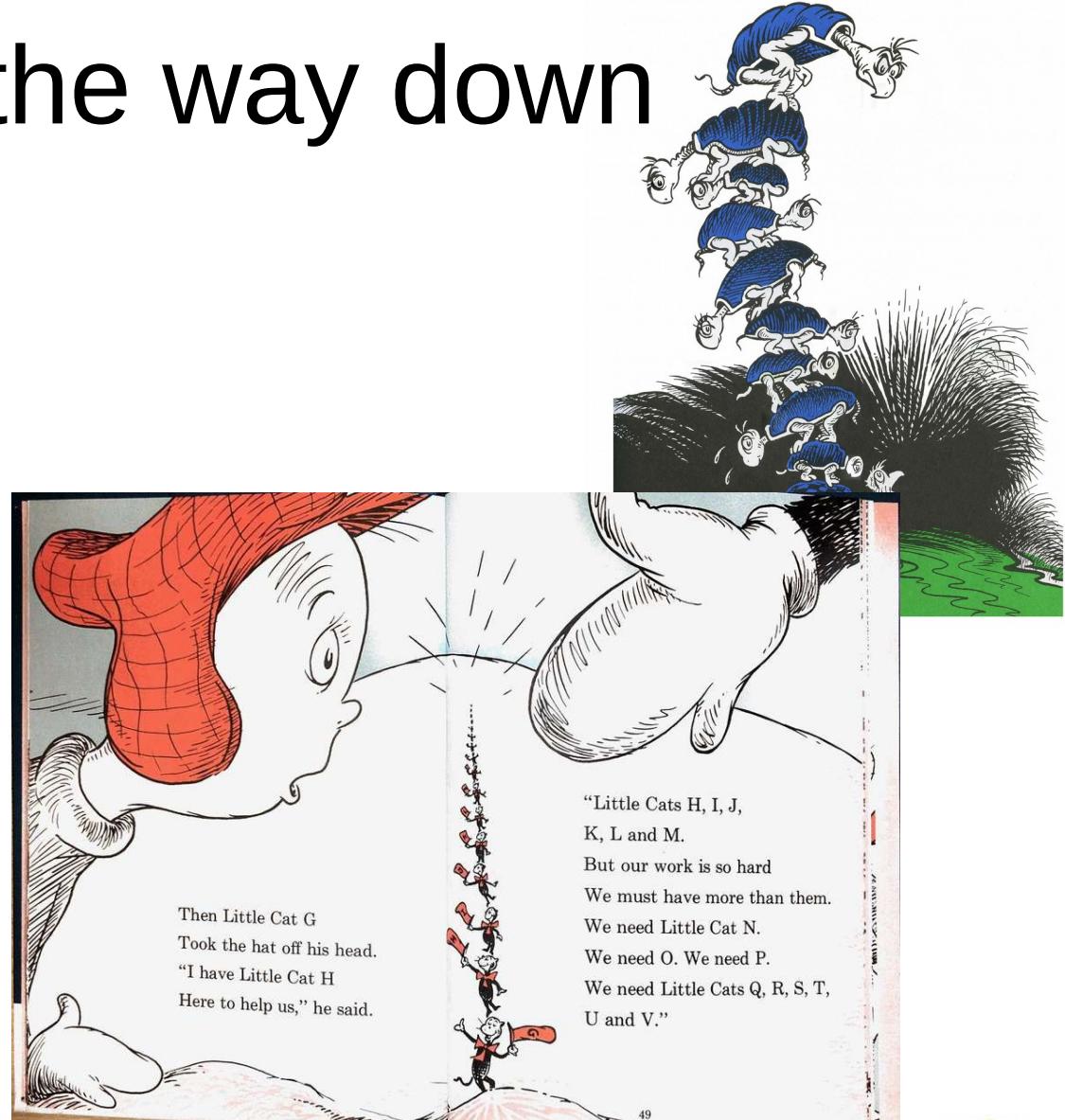
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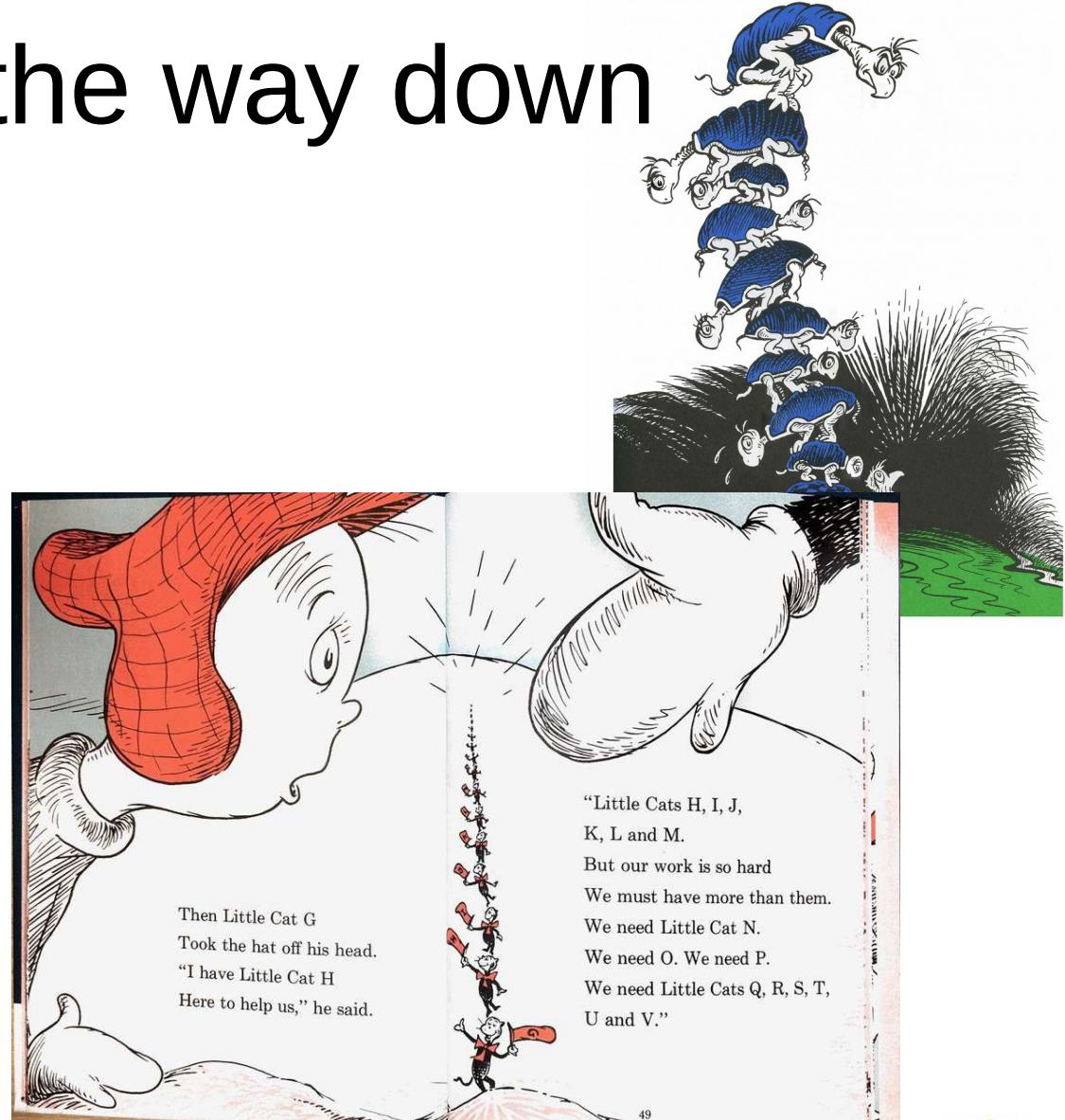


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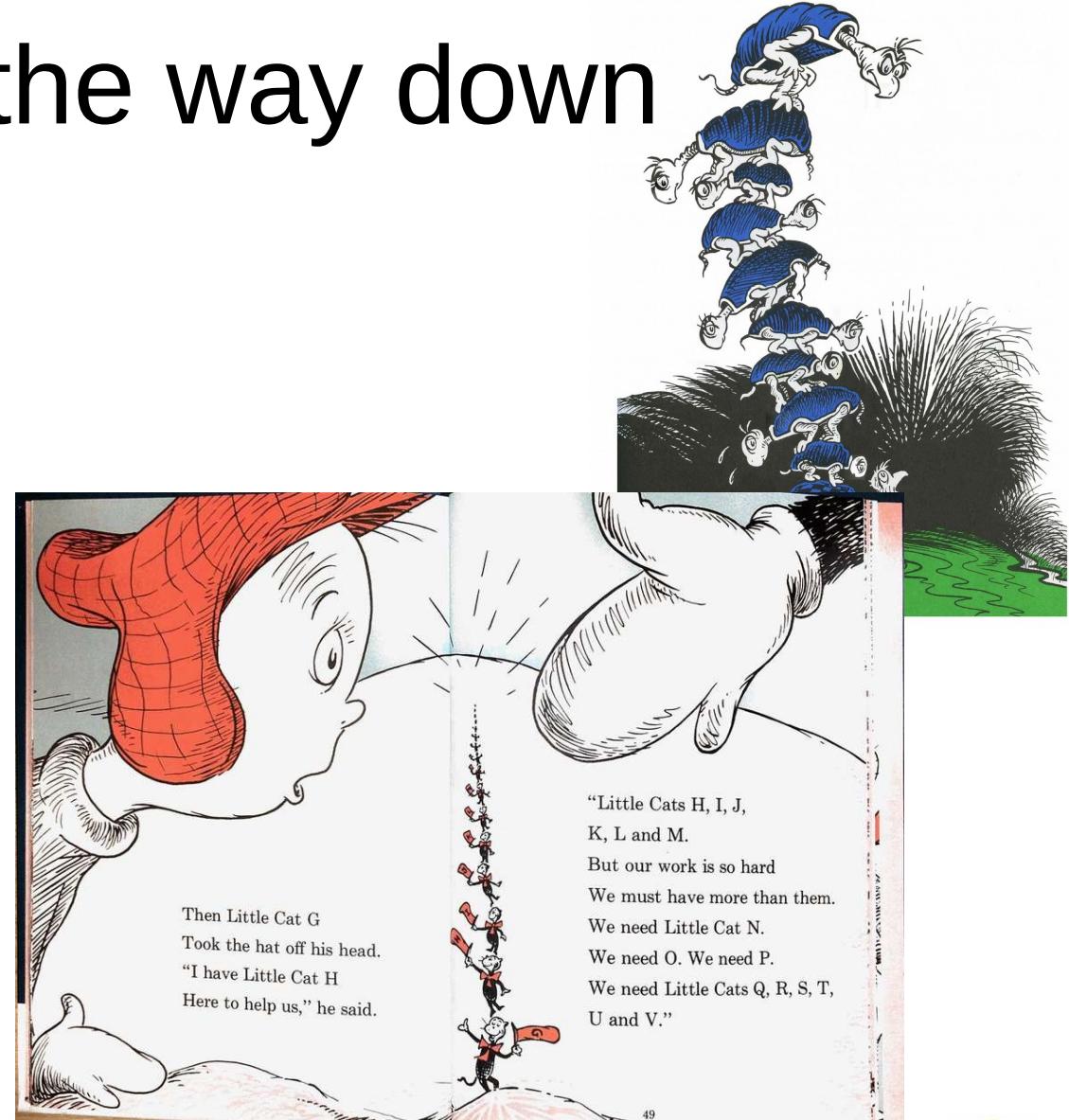
At some point, it's gotta stop,



# Turtles all the way down

- Everytime I thought I'd convinced him, he'd just just complain:
  - You've just added a turtle.

At some point, it's gotta stop,  
There must something down

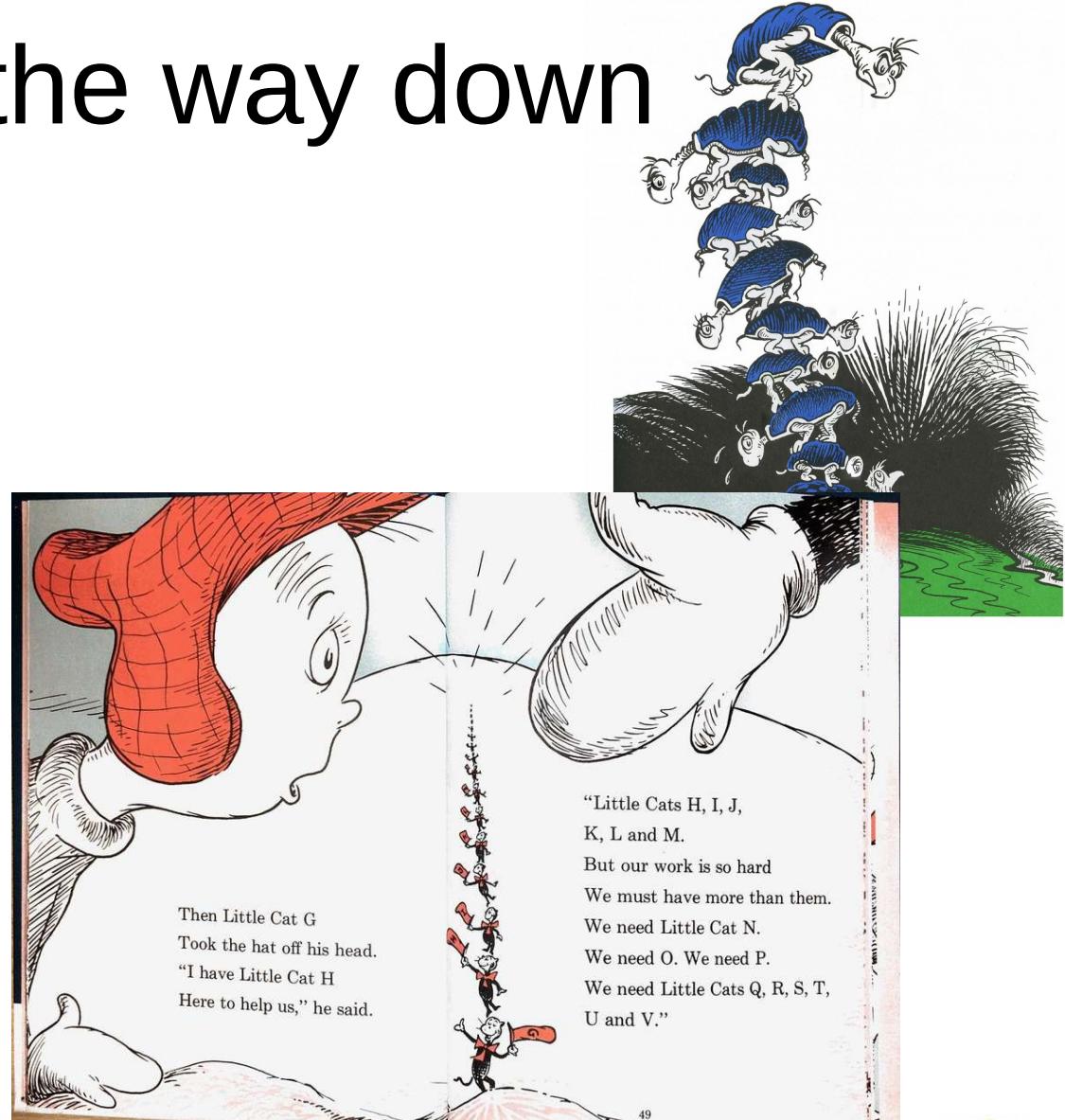


# Turtles all the way down

- Everytime I thought I'd convinced him, he'd just just complain:

- You've just added a turtle.

At some point, it's gotta stop,  
There must something down  
there, he would complain.



# IDevID considerations document

- This document is about the quality of the turtles
  - How do they get there?
  - Can they be trusted?
    - How much?
    - **For what?** (Is the risk mitigation appropriate to the user's threat model?)
- Three fundamental ways to provision initial roots of trust.
- Ultimately, the software update trust anchor **rules everything**.



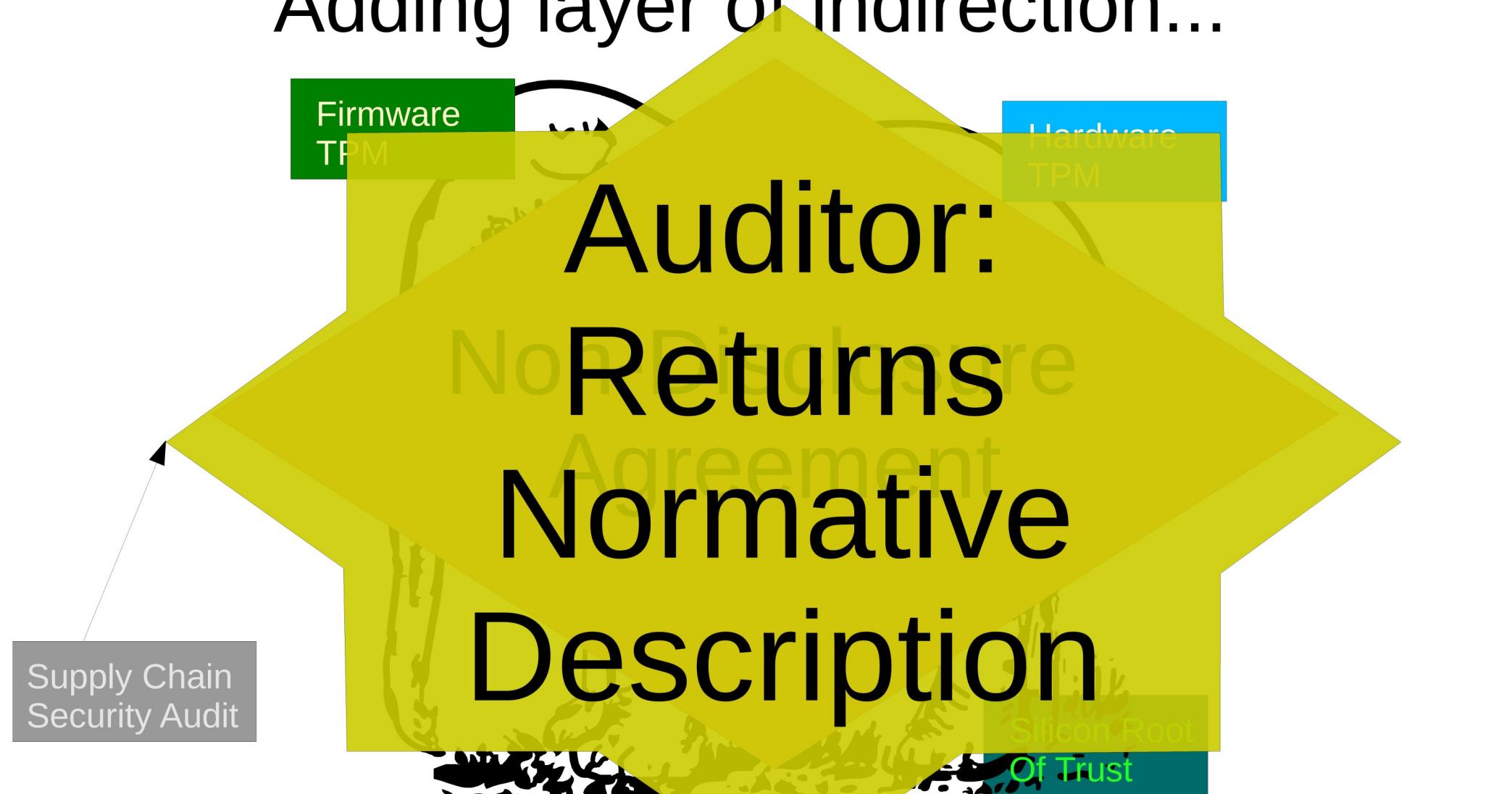
- Insert parable about blind people examining different parts of an elephant.
- [https://en.wikipedia.org/wiki/Blind\\_men\\_and\\_an\\_elephant](https://en.wikipedia.org/wiki/Blind_men_and_an_elephant)



# Confidentiality of IDevID private key..



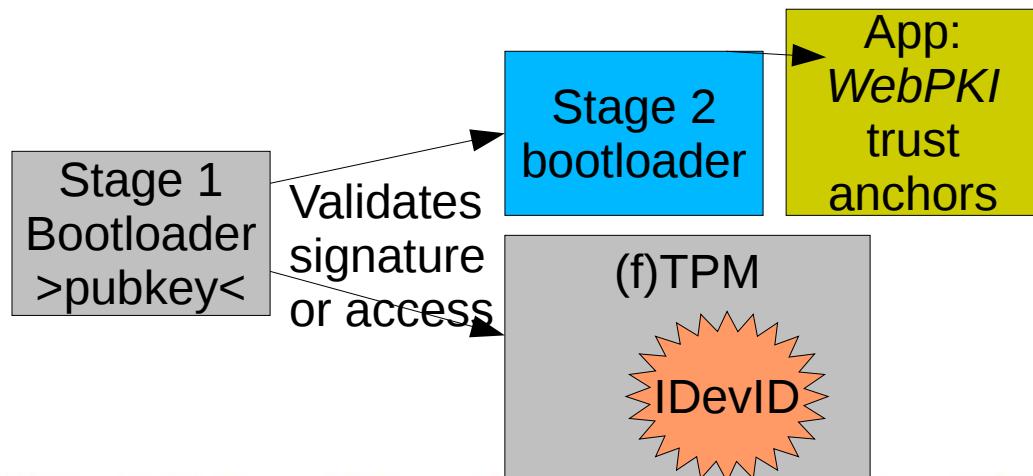
# Adding layer of indirection...



# Audit Model

Recognize:

Posessor of Bootloader  
software update key  
wins all battles.



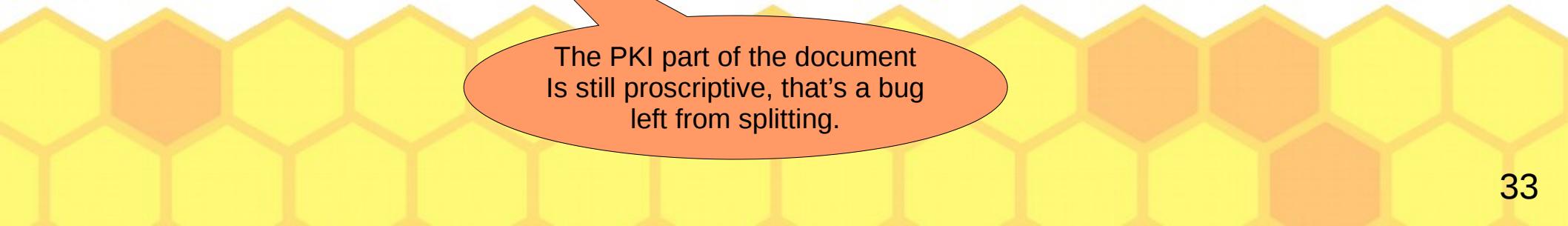
- However >pubkey< is provisioned determines in-system risk of entire system.
  - This is the bottom turtle, “Mack”, and he’d better not burp.
- Even more critical: how is the private key that can sign code kept?

# Non-Goals of the document

- 1) Not aiming to write an ISO27001-ish evaluation process.
- 2) Not going to make any recommendation as to an appropriate solution for a given risk situation.



The PKI part of the document  
Is still prescriptive, that's a bug  
left from splitting.



# Goals of this document

- Enumerate the reasonable, and maybe some less reasonable ways to provision and secure keys, and give them **names**.
- Not just the most secure way, because it is not always worth it.



# History of Document

ANIMA!

draft-ietf-anima  
Autonomic-control-plane  
(ACP). At IESG.

draft-ietf-anima  
Bootstrapping-keyinfra  
(BRSKI). In RFC-editor Q

ANIMA!

# History of Document

ANIMA!

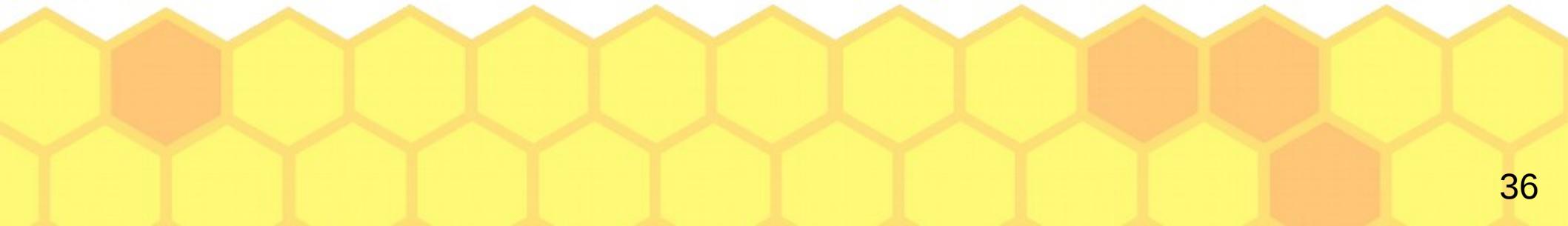
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ANIMA?!

draft-richardson-anima-  
registrar-considerations  
(enterprise private CA)



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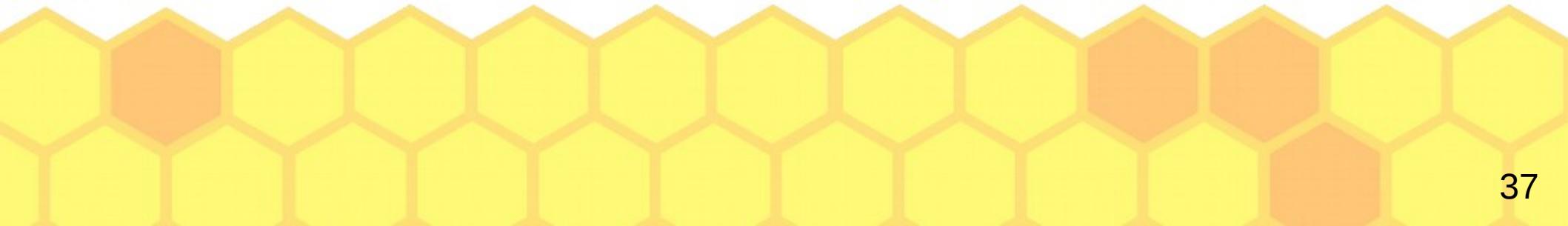
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ANIMA!

ANIMA?!

draft-richardson-anima-  
registrar-considerations  
(enterprise private CA)

draft-richardson-anima-  
masa-considerations  
(vendor private CA + voucher)



# History of Document

ANIMA!

draft-ietf-anima  
Autonomic-control-plane  
(ACP). At IESG.

ANIMA?!

draft-richardson-anima-registrar-considerations  
(enterprise private CA)

draft-ietf-anima  
Bootstrapping-keyinfra  
(BRSKI). In RFC-editor Q

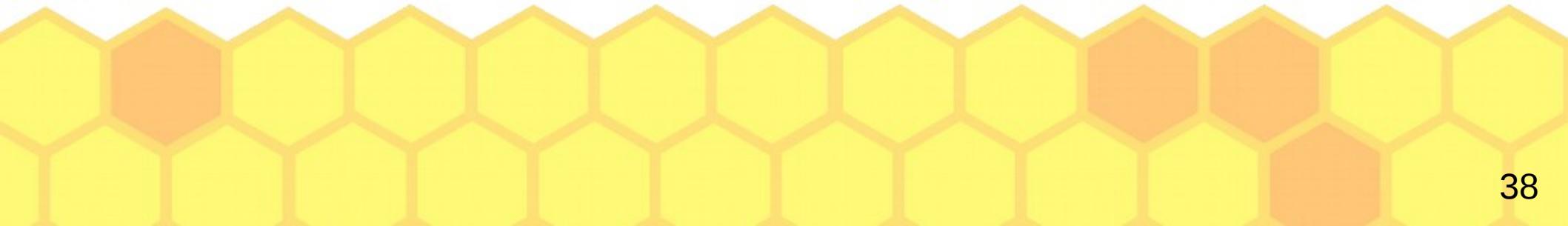
ANIMA!

draft-richardson-anima-masa-considerations  
(vendor private CA + voucher)

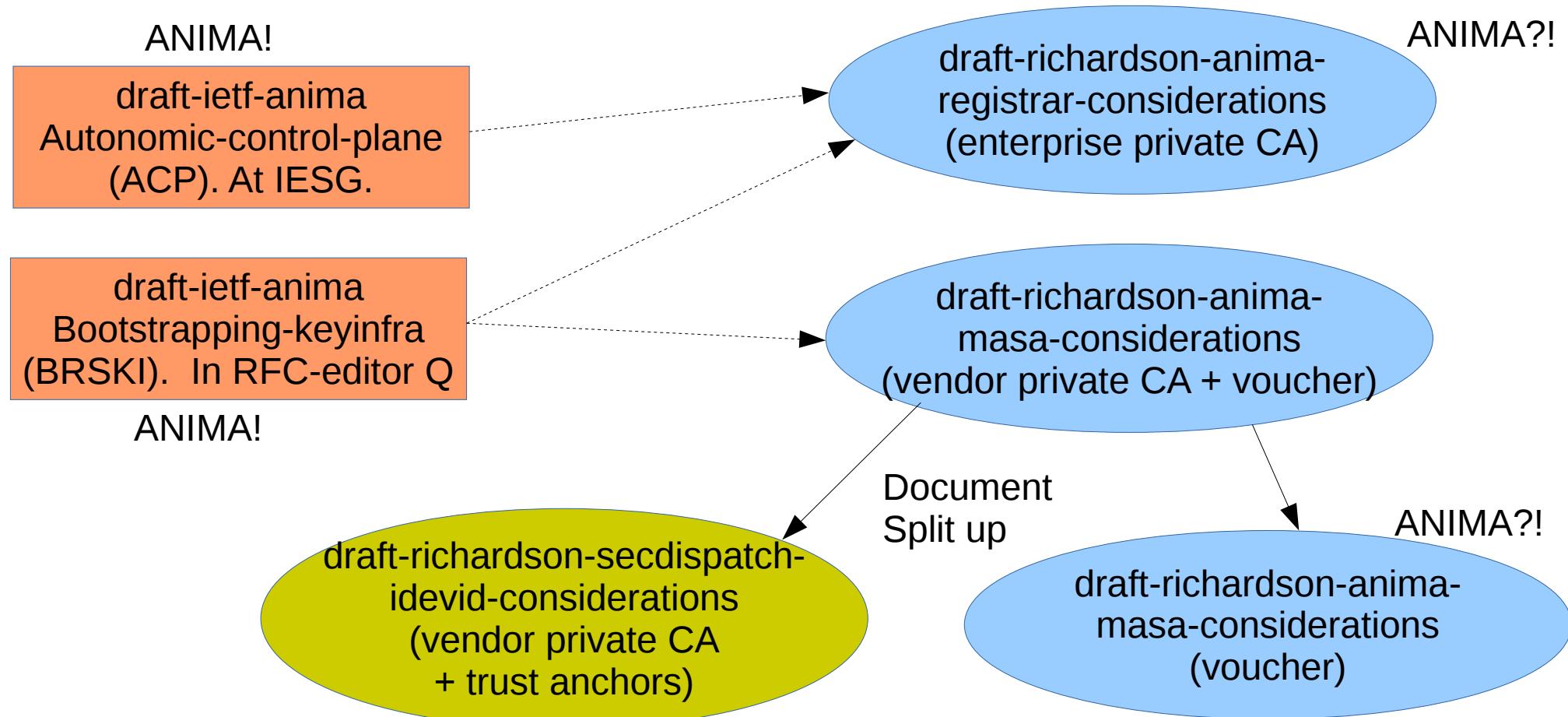
Document  
Split up

draft-richardson-secdispatch-idevid-considerations  
(vendor private CA  
+ trust anchors)

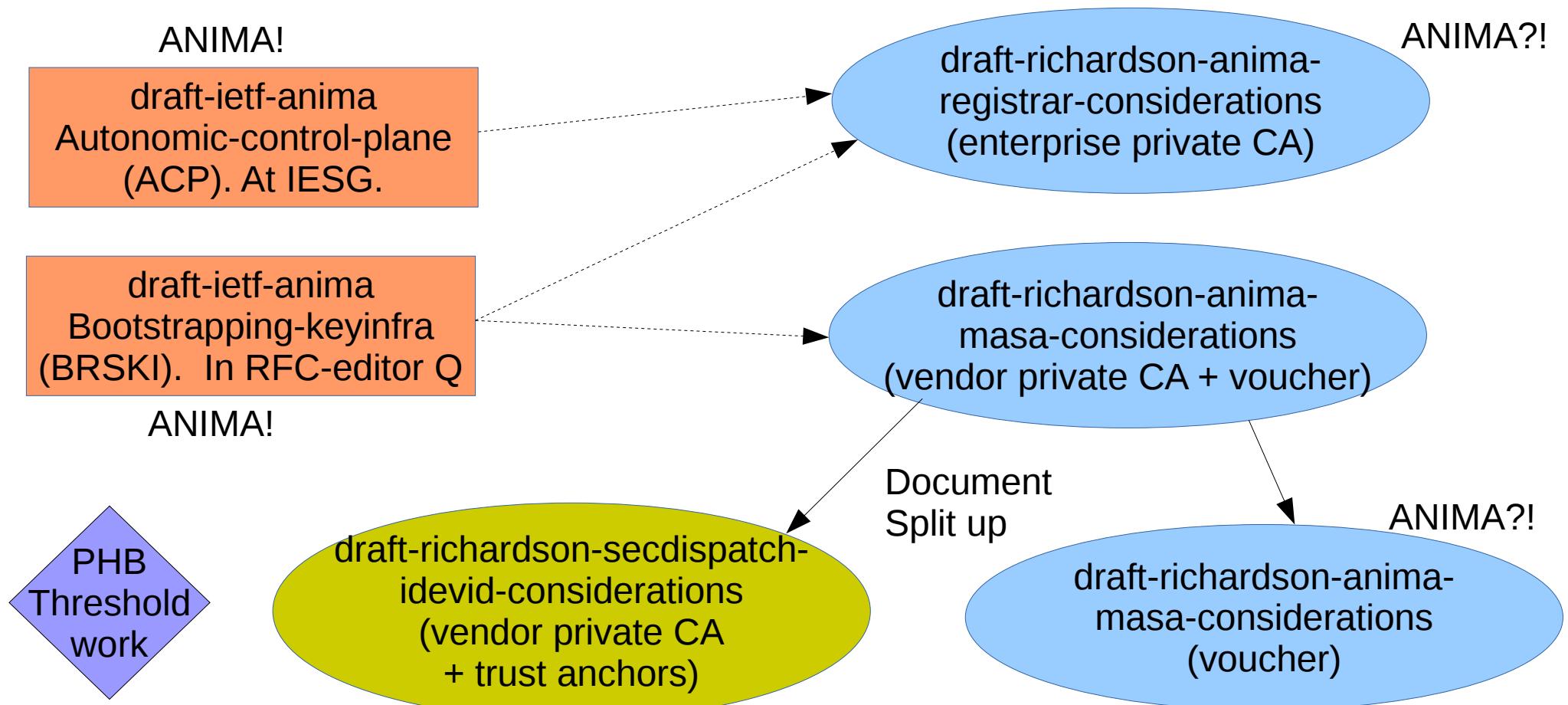
draft-richardson-anima-masa-considerations  
(voucher)



# History of Document



# History of Document



# What to do?

- Supports work in:
  - SUIT
  - TEEP
  - RATS
  - ANIMA
  - LAMPS (CMP)
  - IPsecME, COSE, TLS,...
- But it is not even close to a protocol.
- Also not an applicability draft.
- It would be **referenced** by an applicability draft
  - Probably one in an outside SDO

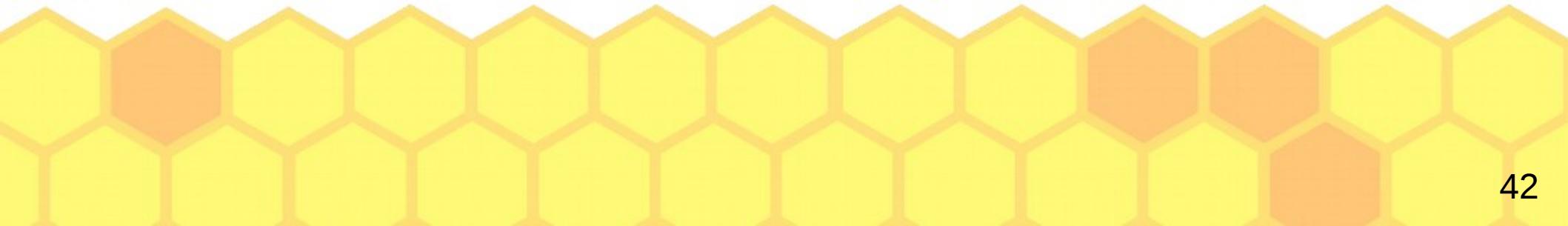
# What to do?

- Do it in SAAG?



- AD sponsor

- Would not get enough review



# Useful Links

- IDevID discussions

- [https://mailarchive.ietf.org/arch/msg/secdispatch/Hqe1IHG2wnW\\_9NxJLazEYbmGYN0/](https://mailarchive.ietf.org/arch/msg/secdispatch/Hqe1IHG2wnW_9NxJLazEYbmGYN0/)
- [https://mailarchive.ietf.org/arch/msg/anima/-2Niz98BNSopDi4GpgxrDfI\\_Mdc/](https://mailarchive.ietf.org/arch/msg/anima/-2Niz98BNSopDi4GpgxrDfI_Mdc/)
- <https://mailarchive.ietf.org/arch/msg/anima/eMOH3NFbEDjZOi5gZgB9EkI6yxw/>
- <https://mailarchive.ietf.org/arch/msg/anima/-6-eQJgtUWrz5v067u9Xb030qnQ/>

- MASA operational considerations

- [https://mailarchive.ietf.org/arch/msg/anima/PSkpYZs0C\\_RLzUFD2BSMipEggfQ/](https://mailarchive.ietf.org/arch/msg/anima/PSkpYZs0C_RLzUFD2BSMipEggfQ/)

# Useless Links and Irrelevant Facts

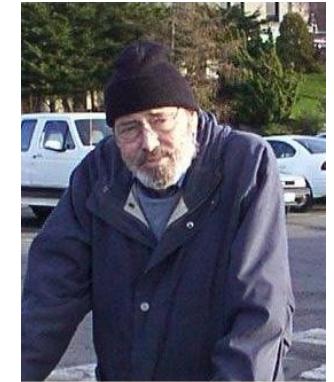
- Return of Cat in the Hat

[https://www.youtube.com/watch?v=YJf2f\\_LqnLo](https://www.youtube.com/watch?v=YJf2f_LqnLo)

- Yertle the Turtle

<https://www.youtube.com/watch?v=xY5vs2WtlKM>

– ..in which the eponymous Yertle, king of the pond, stands on his subjects in an attempt to reach higher than the moon—until the bottom turtle (Mack) burps and he falls into the mud, ending his rule.

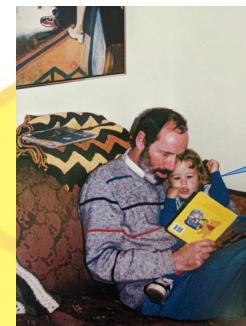


Dr. C. James Richardson

1941-2003



Actually, Sardinia,  
Not London.



Actually,  
My brother jjrh