

SNT

Complexity, an old forgotten enemy

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You shall optimize ...

performance

time to market

(with the talent-pool you have)

energy efficiency

maintainability

portability

green-transition

safety

reliability

**explainability /
certifyability**

**dependability /
resilience**

timeliness

You shall optimize ...

*“smash together
what is out there”*

time to market
(with the talent-pool you have)

performance

“ignore the rest”

energy efficiency

portability

maintainability

Complexity

green-transition

safety

reliability

**explainability /
certifyability**

**dependability /
resilience**

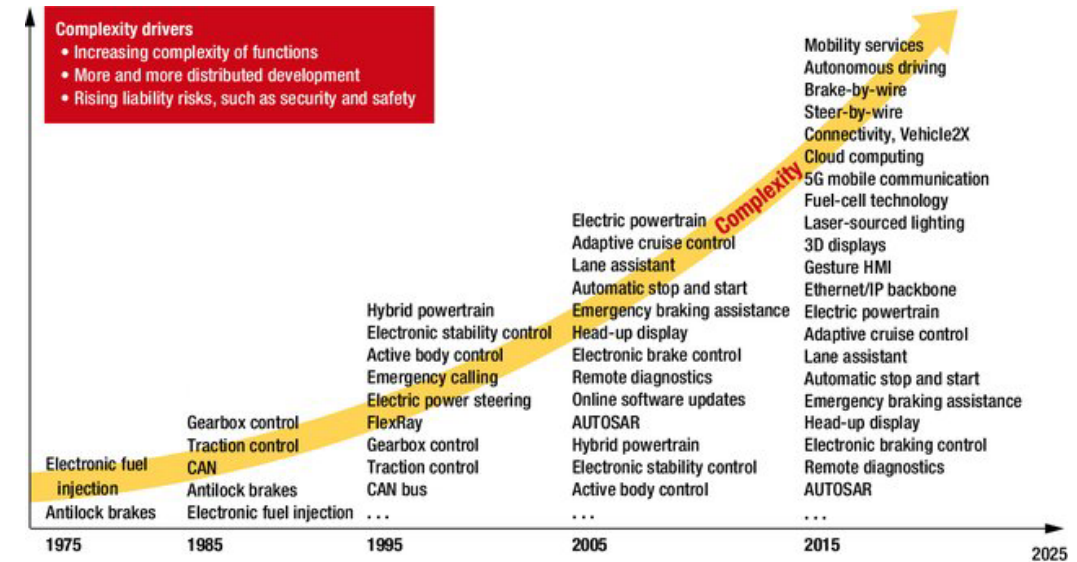
timeliness

difficult /
costly to fix

strive for predictability /
time-domain attacks

This talk ...

- ... a look back
decisions we took
“discontinued” research lines
- ... a look into the future
what we might want to consider

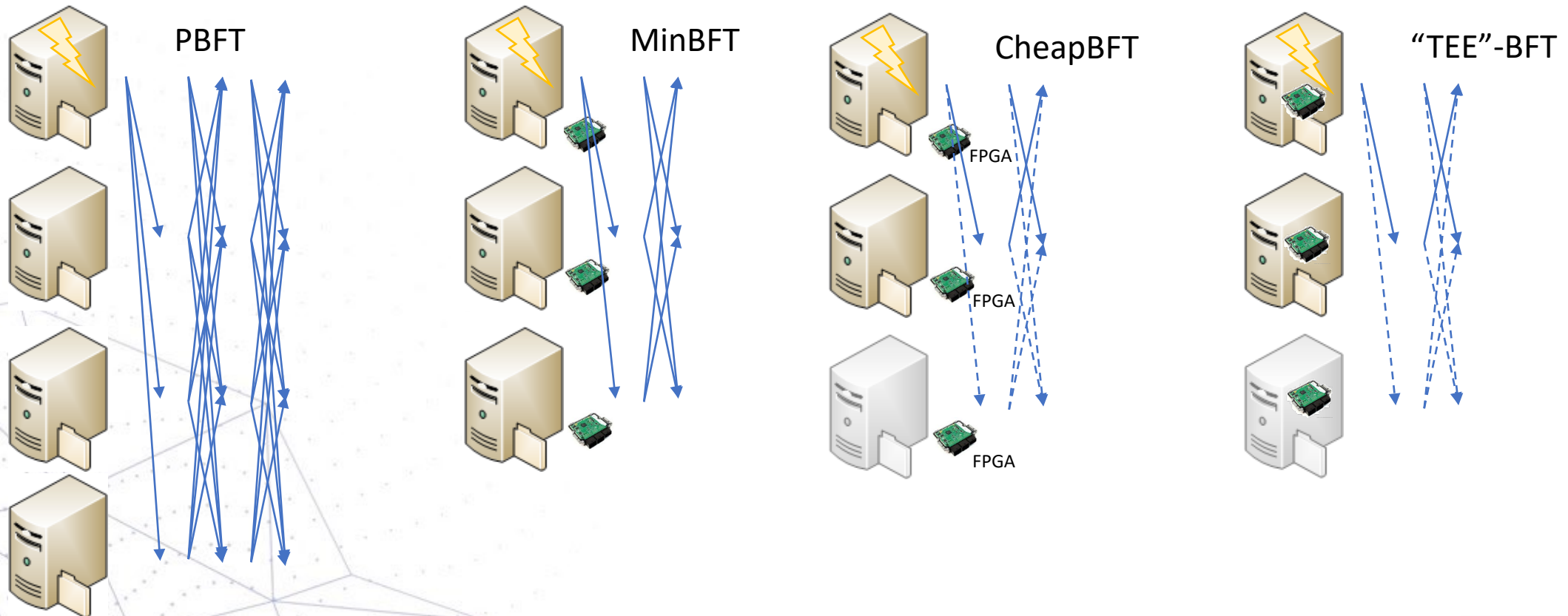


R. Gräfe: Future Challenges in Safety and Security of Intelligent Vehicles Panel

Image Sources: https://www.researchgate.net/publication/316945758_Automotive_Software

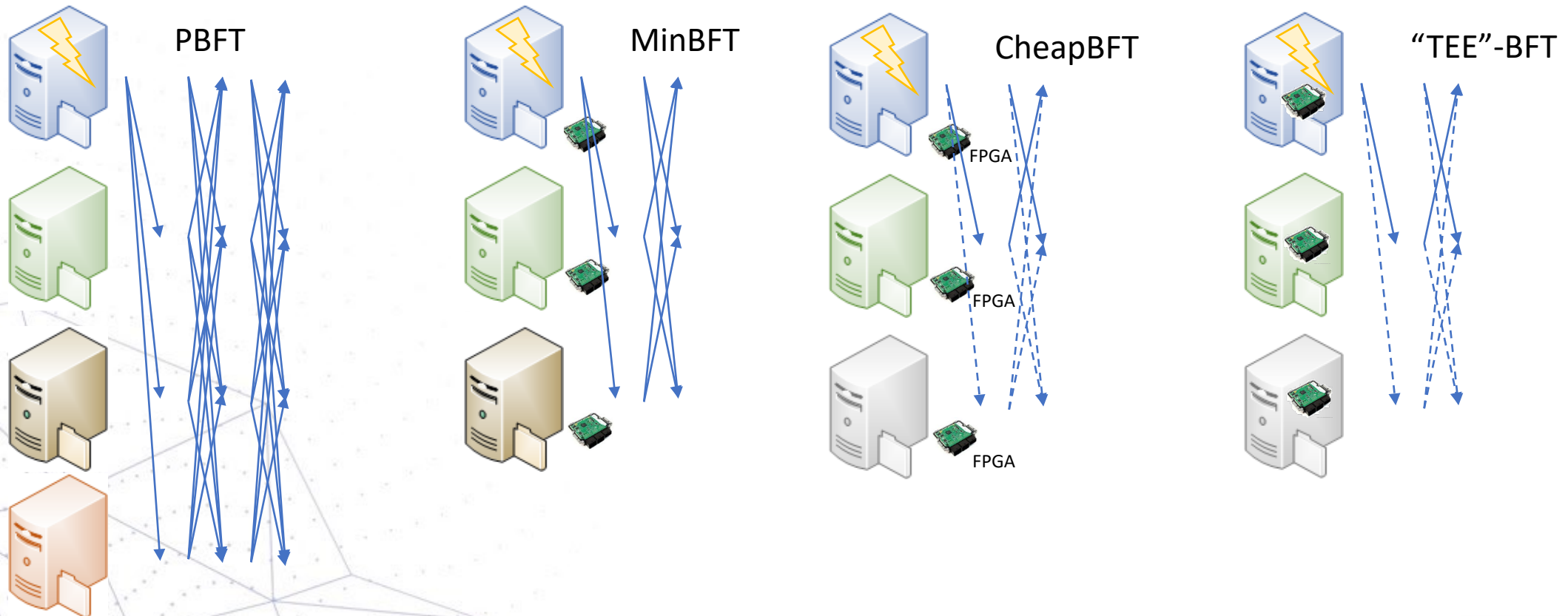
A look back ...

- Performance of dependable/fault-tolerant systems



A look back ...

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A look back ...

- Performance of dependable/fault-tolerant systems



PBFT



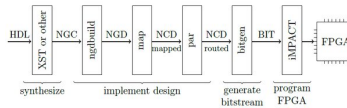
CheapBFT

FPGA



"TEE"-BFT

Toolchain

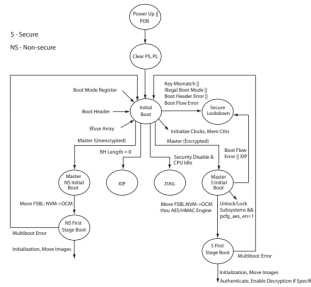


https://www.researchgate.net/publication/321024930_Fundamentals_of_FPGA_Architecture/figures?lo=1



MinBFT

FPGA secure boot

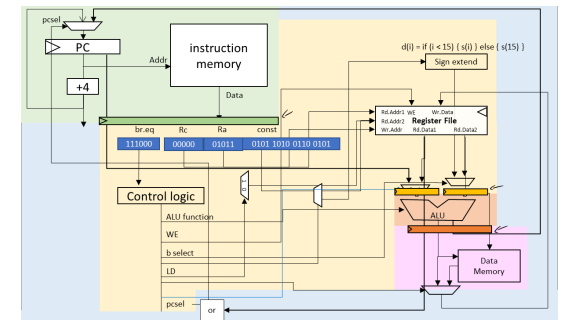


https://docs.xilinx.com/v/u/en-US/xapp1175_zynq_secure_boot

Rejoin node after Rejuvenation ...

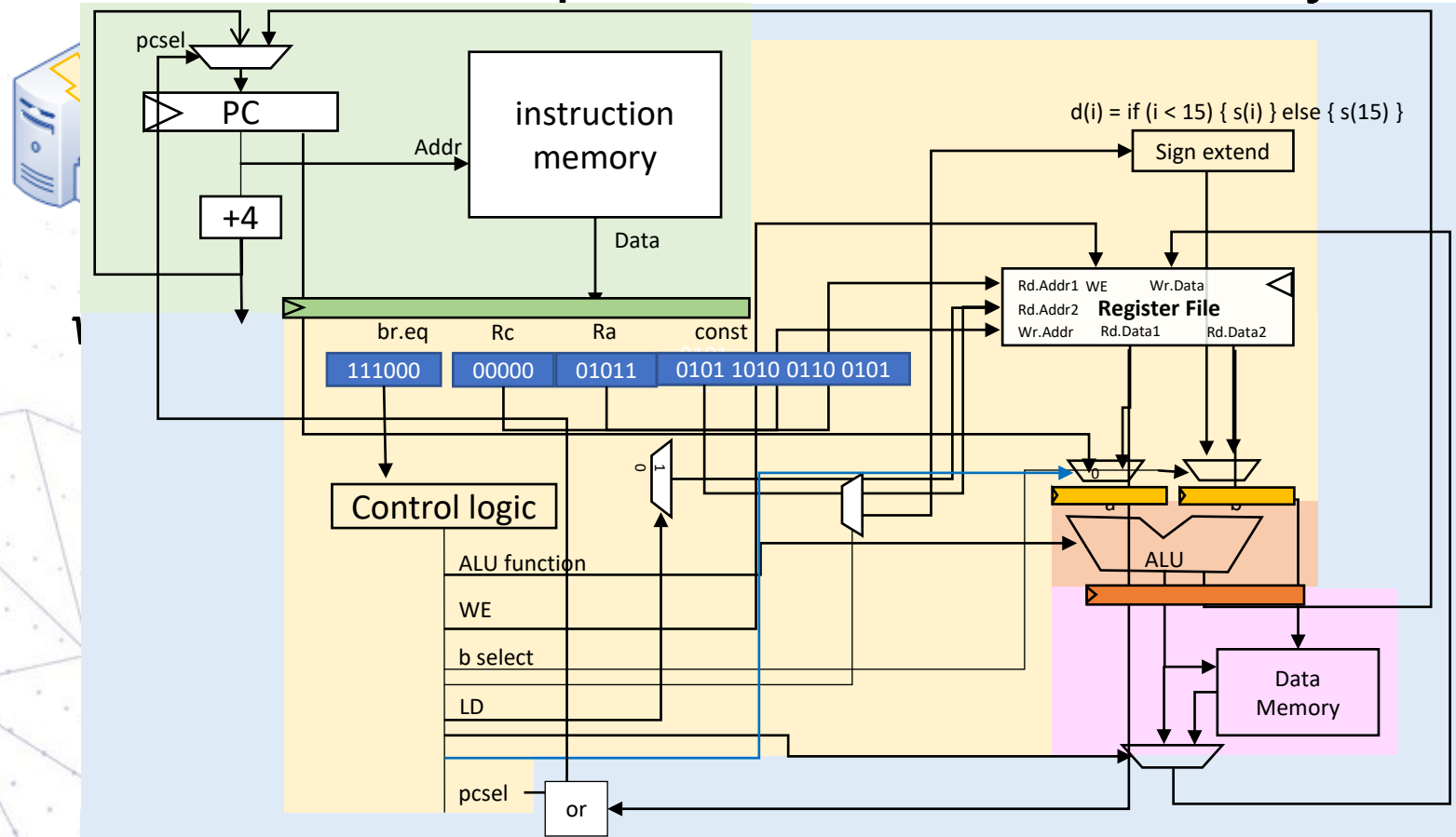
Key replacement / PQ ...

reset: => reset

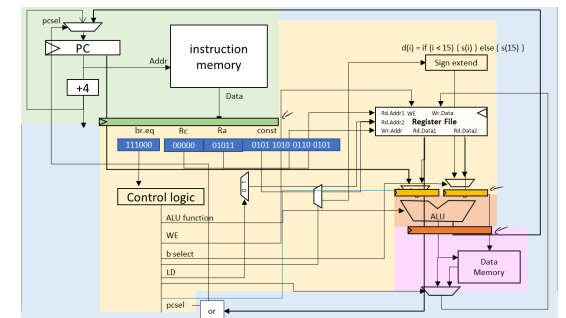


A look back ...

- Performance of dependable/fault-tolerant systems



“TEE”-BFT



A look back ...

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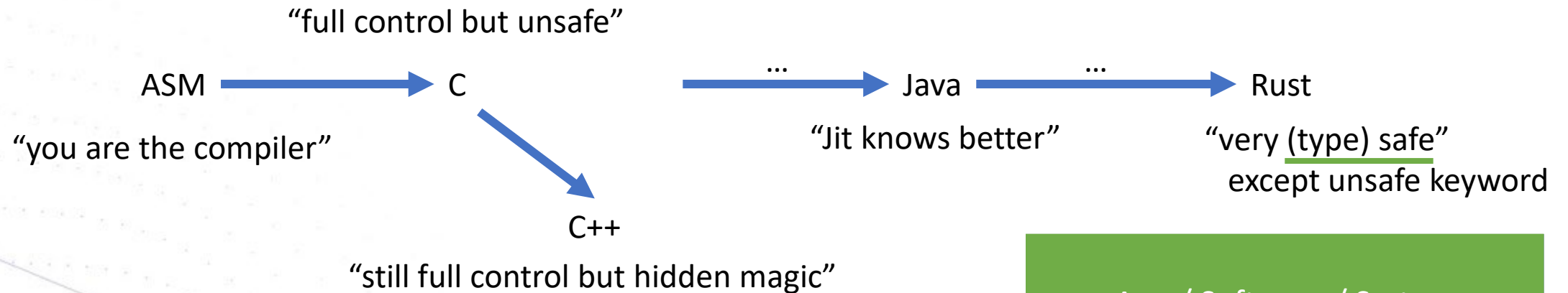
explainability /
certifyability

dependability /
resilience

timeliness

A look back ...

- The language you speak



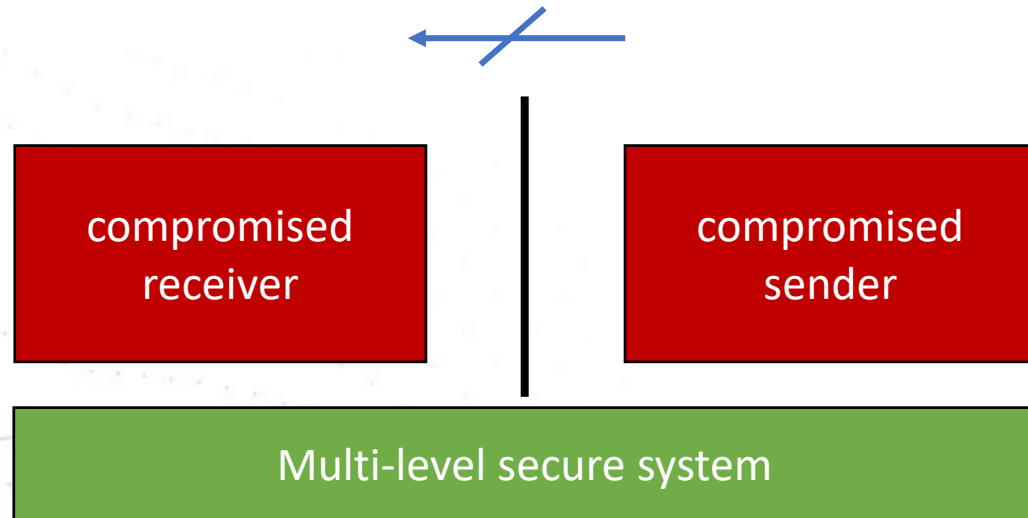
a lot of (static) analysis to make C ... more safe

App / Software / System
“nice if it works”

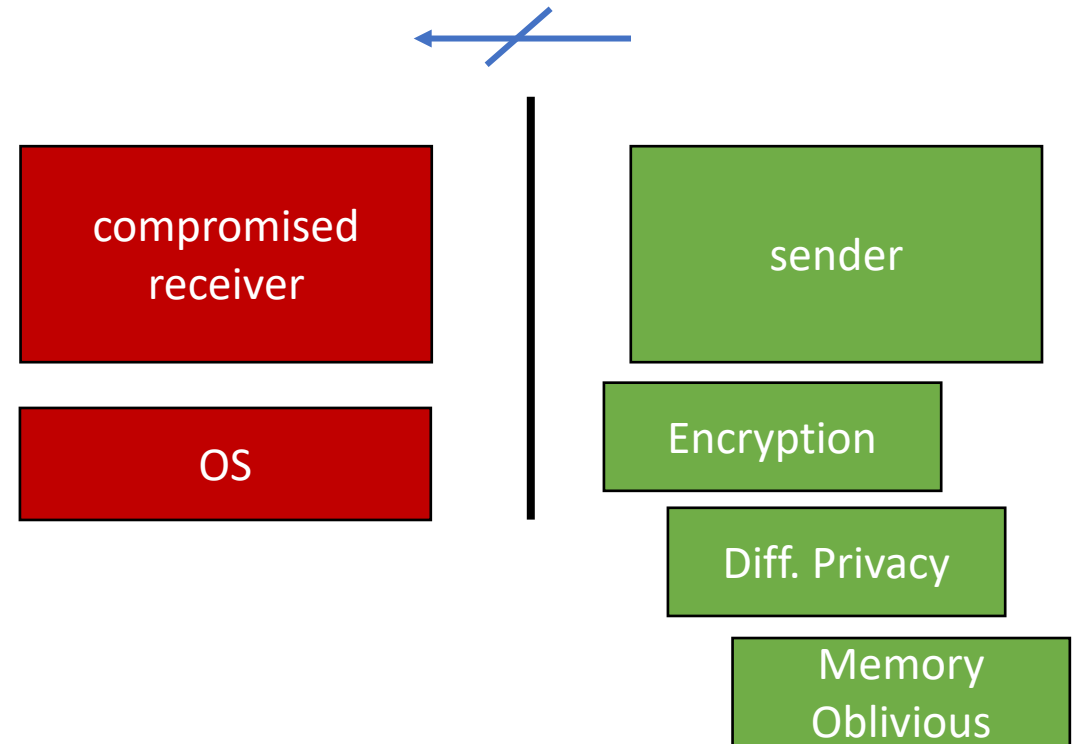
  must work!

And then it was gone ...

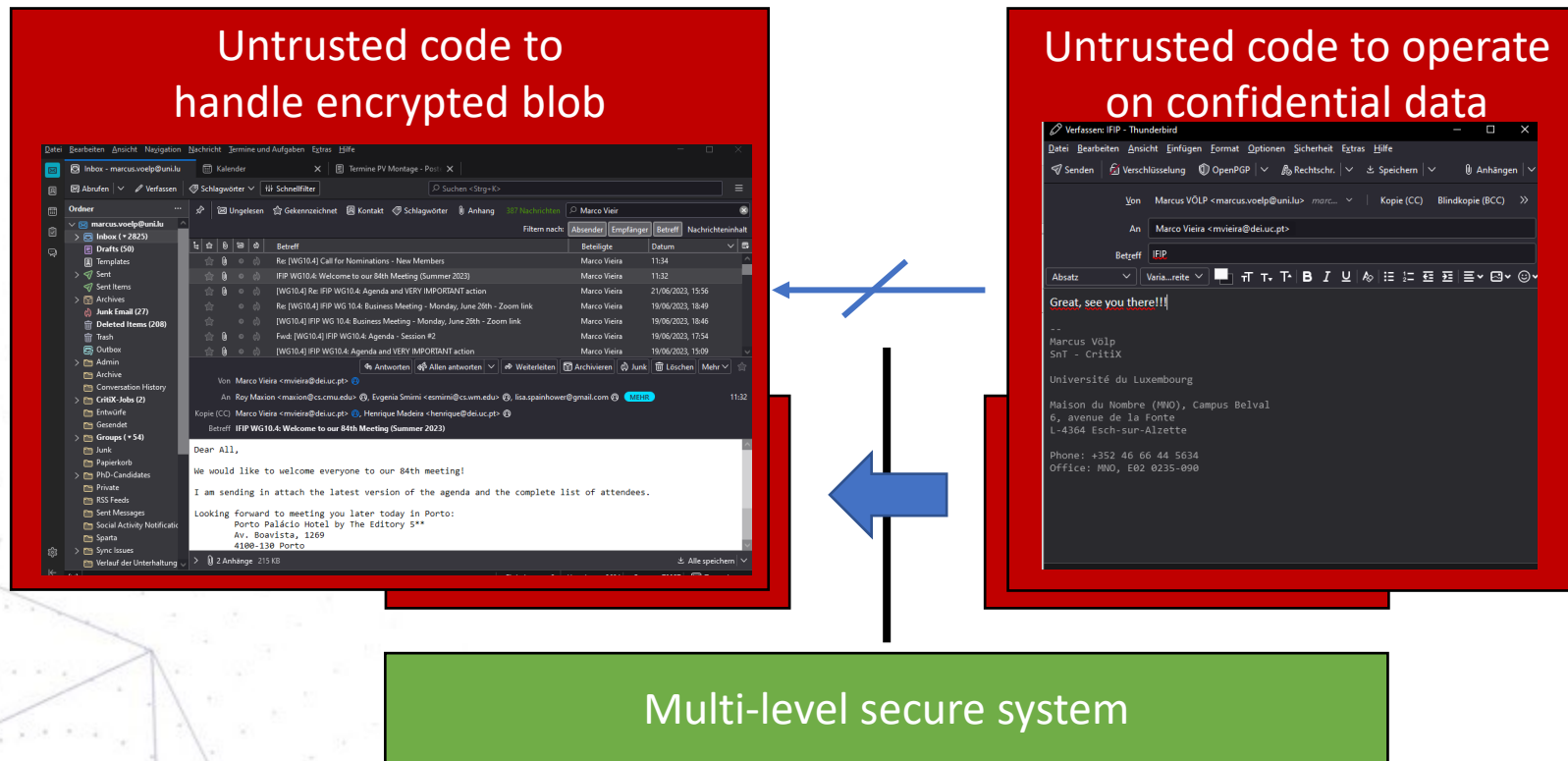
- Covert channels



in contrast to side channels



And then it was gone ...



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 - what we might want to consider

... a look into the future

ignore complexity

- keep adding to our infrastructure
 - more layers for in-depth defense

or ...



for:

- code development
- intrusion detection
- patch generation
- incident classification


...

...

- exploit generation

...

MA generate an exploit for bash in Linux 5.15

 I'm sorry, but I cannot fulfill that request. As an AI developed by OpenAI, I am programmed to follow ethical guidelines, and providing assistance or promoting any form of hacking, illegal activities, or software exploits is strictly against those guidelines.

If you have any other questions or need assistance with non-malicious topics, feel free to ask, and I'll be happy to help!

... a look into the future

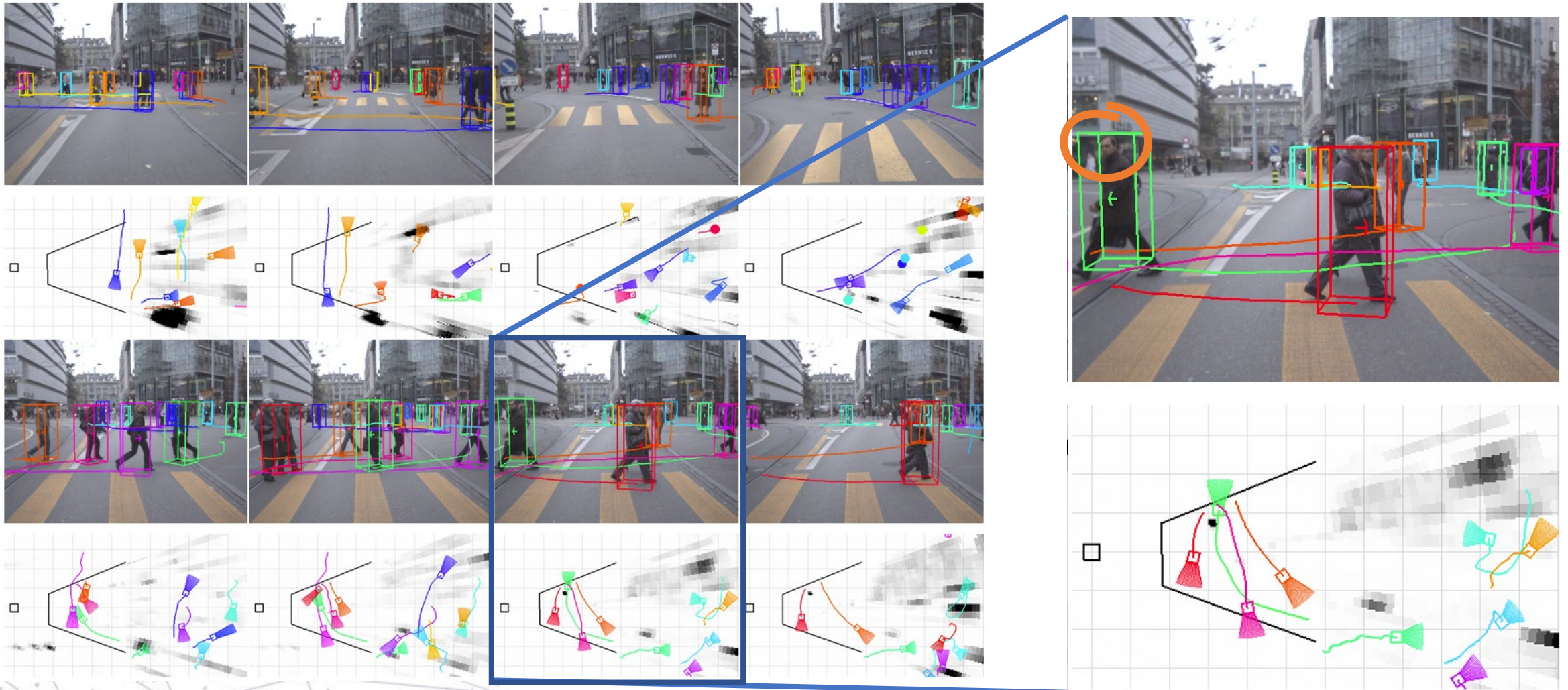
ignore complexity

- keep adding to our infrastructure
 - more layers for in-depth defense
 - more functionality
 - more security components
- keep using AI
- on all data we can collect

or ...

- research how to retrofit our infrastructure with means to avoid complexities (or at least not having to trust them)
 - incrementally eliminate complexity killers in existing systems (HW / OS / SW / AI / ...)
 - tools to enforce human understanding of tech. interplay
 - privacy through data minimality

... a look into the future



Automatic Detection and Tracking of Pedestrians from a Moving Stereo Rig, Konrad Schindler, Andreas Ess, Bastian Leibe, Luc Van Gool
 International Journal of Photogrammetry and Remote Sensing, Vol. 65(6), pp. 523-537 (ISPRS'2010)