



Data-Centric IoT Networking: Opportunities, reasons & challenges

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Where are we today?

Current use cases

Personal



Enterprise



Industry

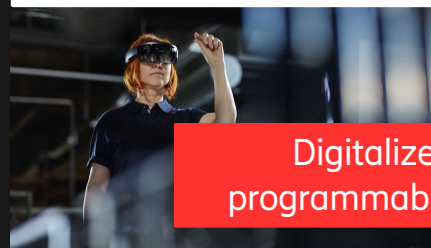


Society



Growing new uses

The Internet of Senses



Connected Intelligent Machines



Digitalized & programmable world



Cognitive Systems





Where are we today?

Practices

Everything in Cloud

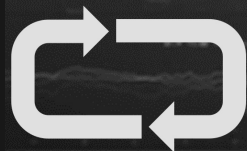


Communication security



TLS 1.3

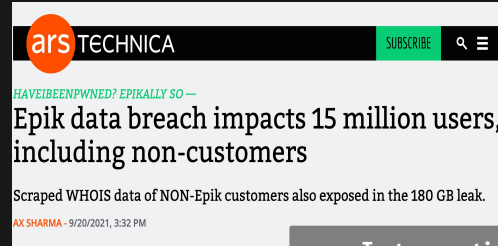
Data-oriented processes



Brains

Challenges

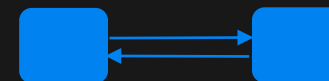
Server leaks



Commercial surveillance



Interaction models without perfect fit



Opportunities: Using the web model in new ways



Data-oriented designs

CoAP observe interfaces

Data-object security

OSCORE

Publish-subscribe data transmission mechanisms

...

Opportunities: Security



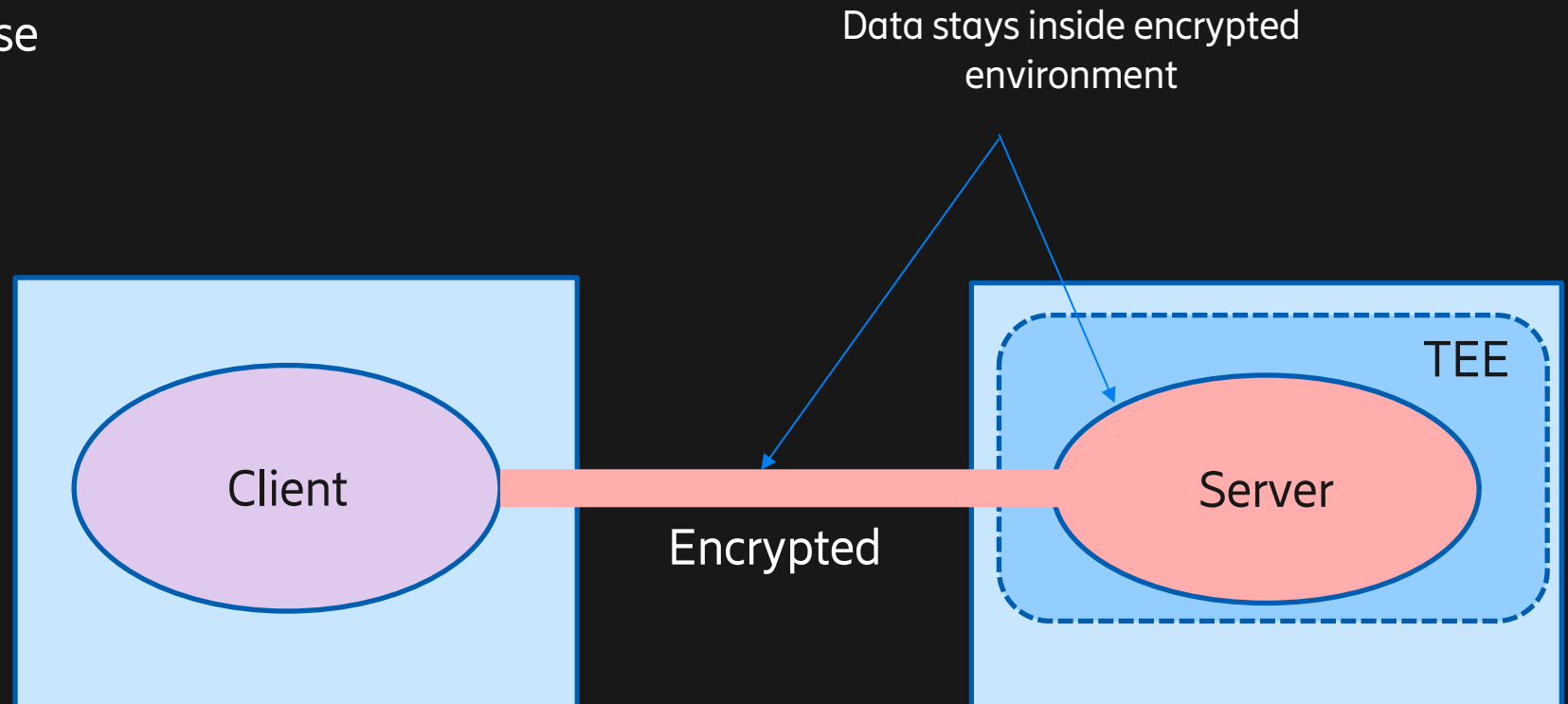
Beyond communications security

Protecting data at rest & in use

Oblivious protocols

Confidential computing

...



Opportunity: Sensing in networks



6G Joint communication and sensing

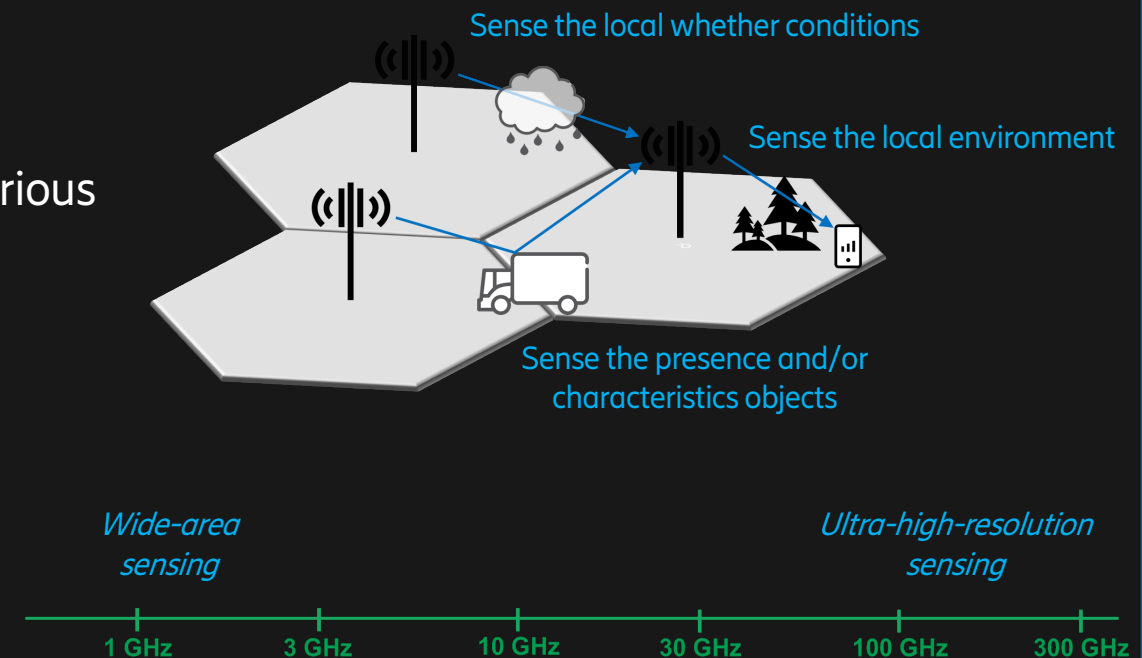
Sensing functionality as an integrated part of the communication network

- Higher frequency communications allow sensing the environment
- "Each blockage of a communication link is a sensing opportunity"*

Needs massive data flows & intelligence to recognize what various sensing observations mean (e.g., car, pedestrian, animal, ...)

Needs a new way to convey results to applications

- Different from today's PDP contexts, tunnels, bit pipes



*) Chaccour et al: Seven Defining Features of Terahertz (THz) Wireless Systems: A Fellowship of Communication and Sensing

