



# 5G SECURITY DRIVEN BY DEUTSCHE TELEKOM

T · · Systems ·

Stefan Schröder  
Dr. Sven Lachmund

# INNOVATION IS TOP PRIORITY FOR DT

## DT DRIVE AND CONTRIBUTE TO INTERNATIONAL STANDARDS

Mobile networks require  
global interworking and  
compatibility

Standards are key



DT drive important global standards –  
including security

Everybody can benefit from standardised  
security controls

DT experts have key roles in  
relevant standardisation  
organisations

Most relevant for the mobile network  
are **3GPP** and **GSMA**

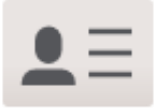


A vibrant pink background featuring a dynamic splash of liquid, creating a sense of movement and energy. The splash is centered and spreads outwards, with various droplets and streaks of liquid. The overall tone is bright and modern.

# **FLEXIBILITY FOR NEW BUSINESS AUTHENTICATION FRAMEWORK**

# 5G – AUTHENTICATION FRAMEWORK

## FLEXIBILITY FOR NEW USE CASES



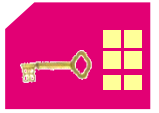
Access credential

= Name + proof (secret)



Need for alternatives

- Physical aspects
- Environment: factory, campus
- Cost?
- Different risk (sharing) models

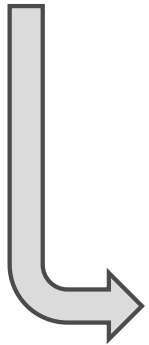


Security requirements

- Strong authentication
- Create keys for radio security
- Customer side store with evaluated security
- Secure distribution logistics



5G supports EAP:  
Extensible Authentication Protocol

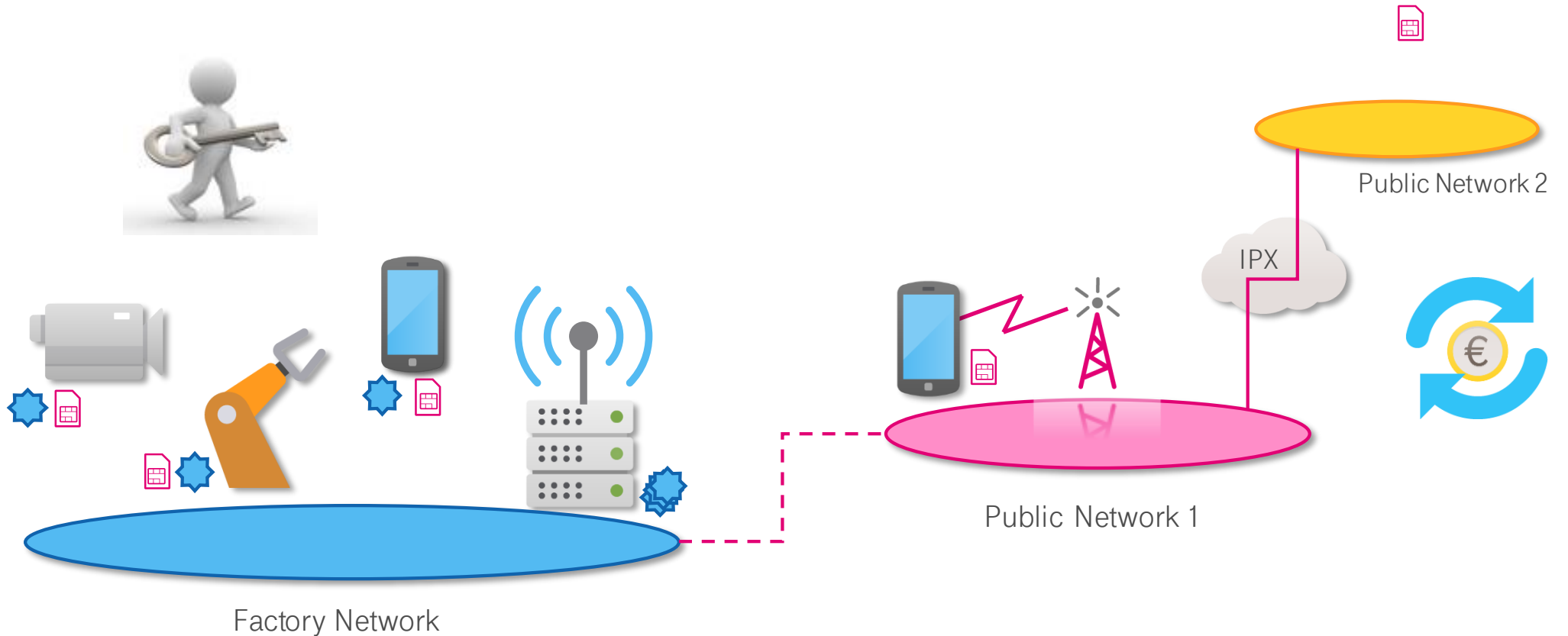


Hard-coded within 2G-4G protocols!



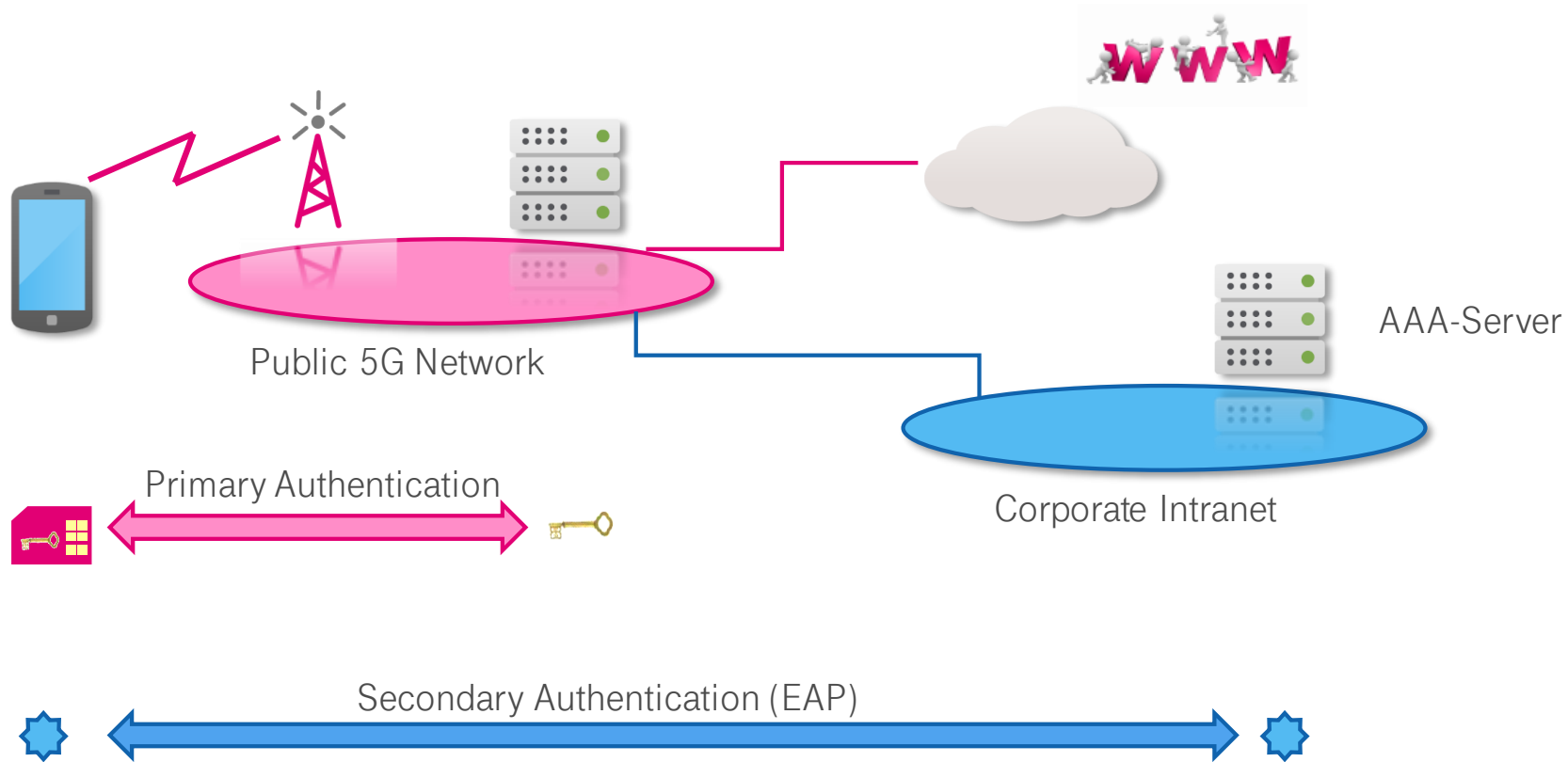
# 5G – NEW USE CASE: FACTORY/CAMPUS NETWORKS

## SECURITY AND RISK SHARING



# 5G – INTRANET ACCESS WITH CUSTOMER CONTROL

## SECONDARY AUTHENTICATION

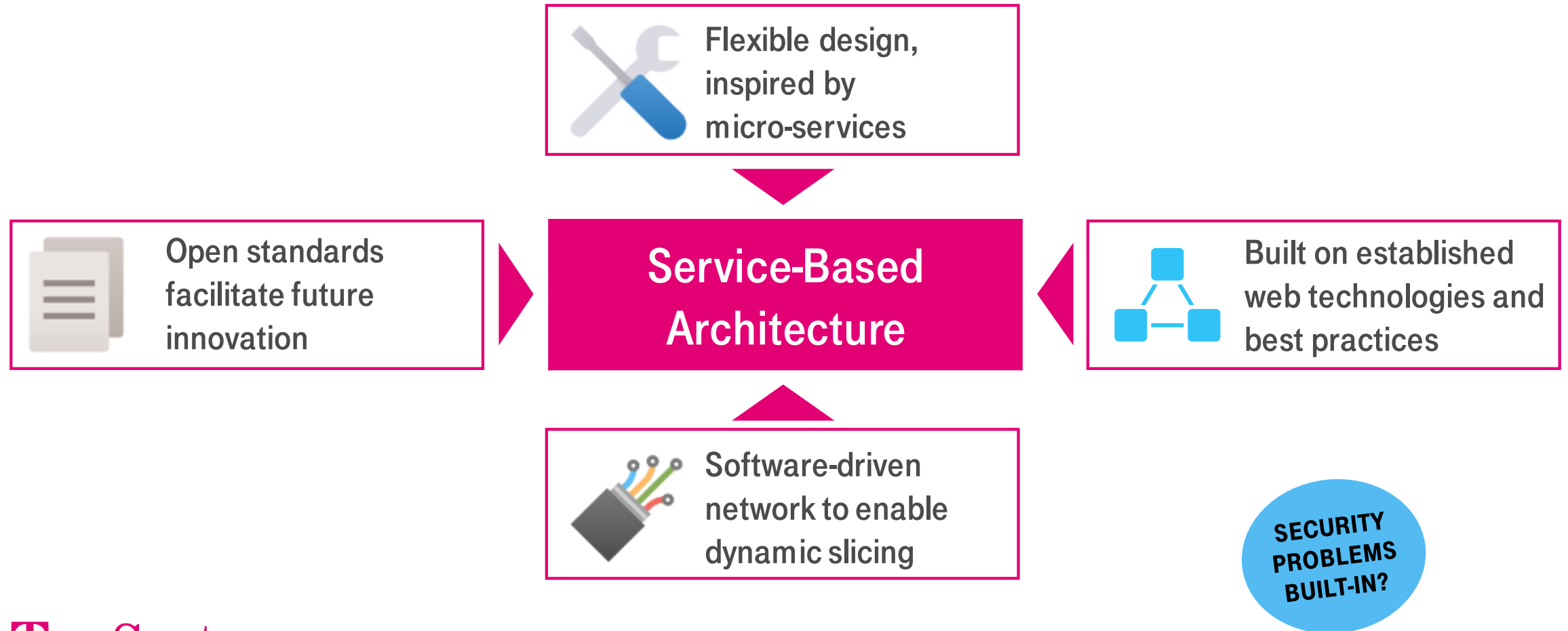




**5G USES WEB TECHNOLOGIES –  
WE SECURE THEM**

# 5G ARCHITECTURE EVOLUTION

## WIDELY USED WEB PROTOCOLS – SECURITY ISSUES INHERITED





# IMPROVED ROAMING SECURITY

## LESSON: STANDARDISE SECURITY FROM THE START



- Legacy inter-operator signalling in 2G/3G source of varieties of malicious traffic
- Complex SS7 protocol stack proven vulnerable by several research papers
- 4G/LTE improves on that, but carries over some legacy protocol vulnerabilities
- Requires special mitigation by use of additional filter elements
- 5G architecture incorporates DTAG-defined Security Edge Protection Proxy
- Mandatory network function and cornerstone of enhanced roaming security

# SECURITY EDGE PROTECTION PROXY (SEPP)

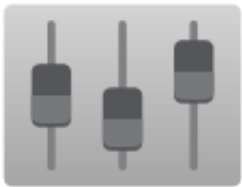
## PROTECTS MOBILE NETWORK & TRANSMITTED DATA



- Protects mobile network from incoming malicious traffic
- Enforces operator-defined security policies, plausibility checks, rate limit



- Protects outgoing traffic from eavesdroppers and unintended modifications
- Use of asymmetric cryptography ensures authentication and traceability



- Dynamically configurable level of protection for various use cases
- Built on established security frameworks and formatting standards

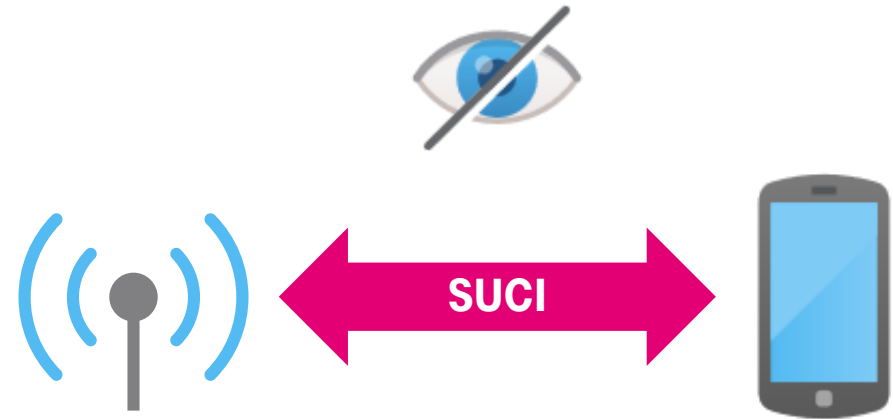


# ENHANCED USER PRIVACY IN 5G

# 5G ENHANCEMENTS TO USER PRIVACY

## NO IDENTIFIER SENT IN THE CLEAR

- Objective: Defeating the infamous „IMSI-Catcher“
- Earlier generations allowed cleartext transmission of permanent subscriber ID in certain scenarios
- With 5G only the Subscription Concealed Identifier (SUCI) is ever revealed on the air interface
- Solely the home network provider can decipher a subscriber's identity by use of its private key
- Future-proof by algorithm agility





# **SECURITY ASSURANCE FOR (5G) NETWORK PRODUCTS**

# NETWORK EQUIPMENT SECURITY ASSURANCE

## MEASURABLE BASELINE OF SECURITY FOR THE INDUSTRY

### What it is

A security baseline to evidence that:

- Network equipment satisfies a list of security requirements;
- Network equipment has been developed according to standard guidelines

Security evaluation of  
network equipment

+

Accreditation of  
equipment vendors

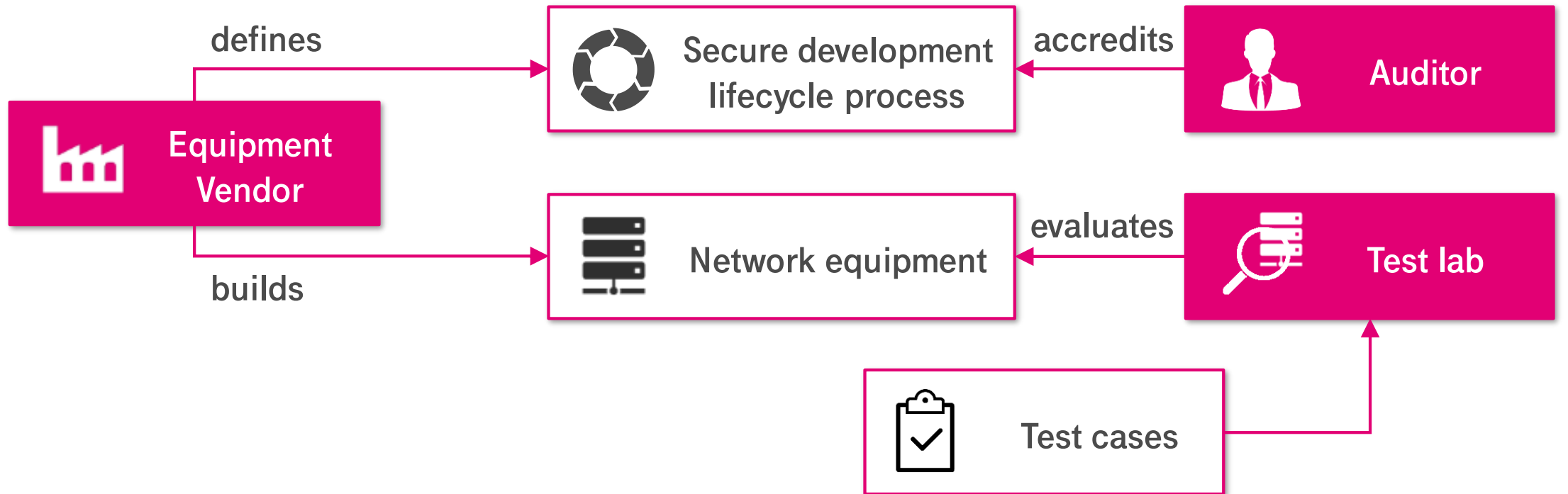
### Security gain

- **DT will run a robust and secure (5G) network**  
Increasingly important due to ever growing complexity and interconnectedness
- **Roaming will become more secure for DT customers**  
If other operators follow DT

# NETWORK EQUIPMENT SECURITY ASSURANCE

MEASURABLE BASELINE OF SECURITY FOR THE INDUSTRY

## How it works



A vibrant pink background featuring a dynamic splash of liquid. The splash is centered and spreads outwards, creating intricate, organic patterns with various droplets and thin trails of liquid. The overall effect is energetic and celebratory.

**THANK YOU**  
**QUESTIONS?**