HOCHSCHULE MITTWEIDA
University of Applied Sciences

IARIA INTERNET 2025

Design Concepts to Satisfy User Data Accessabily of IoT Devices Postulated by the EU Data Act

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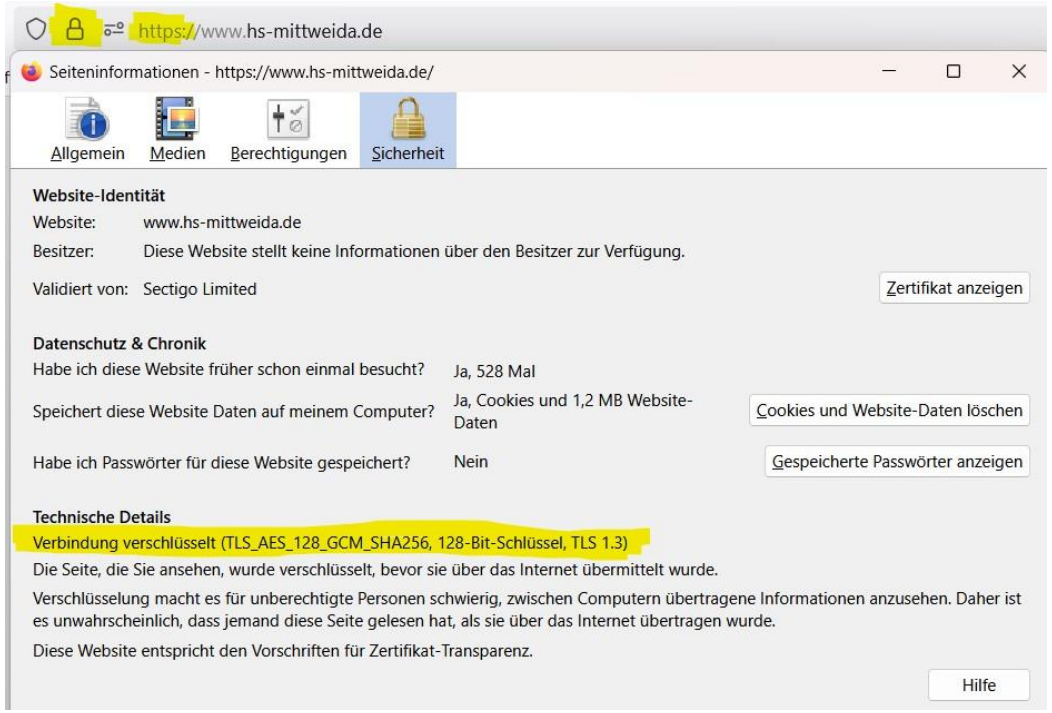
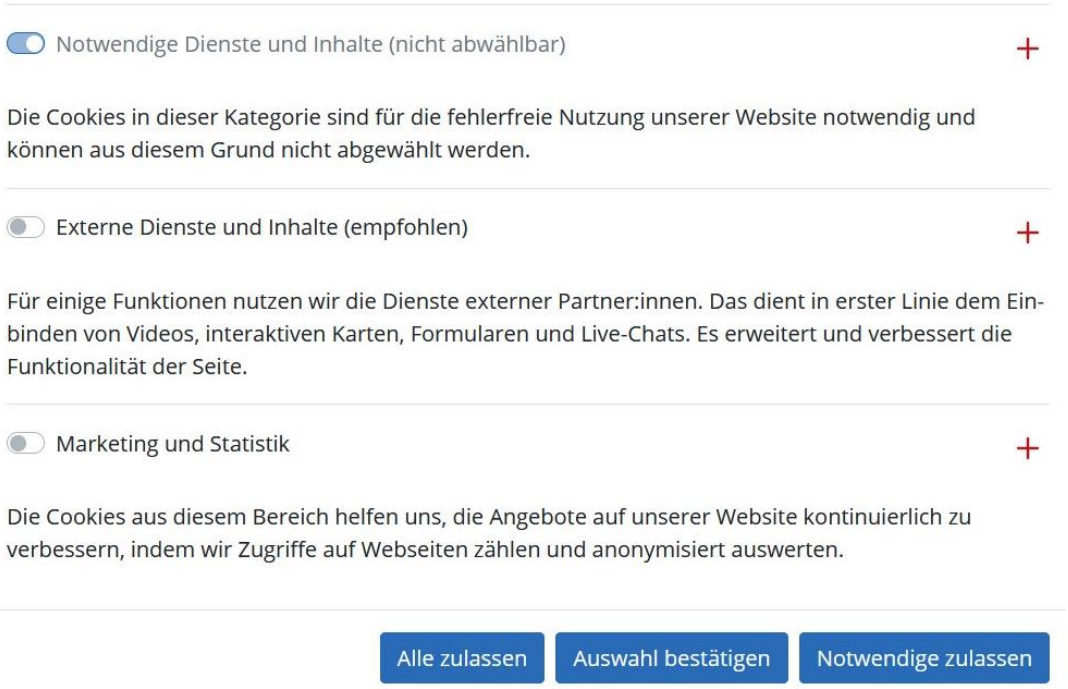
The Internet is shaped by

Technological innovation



TLS-Encryption

Legislative regulation



Cookie-Banner

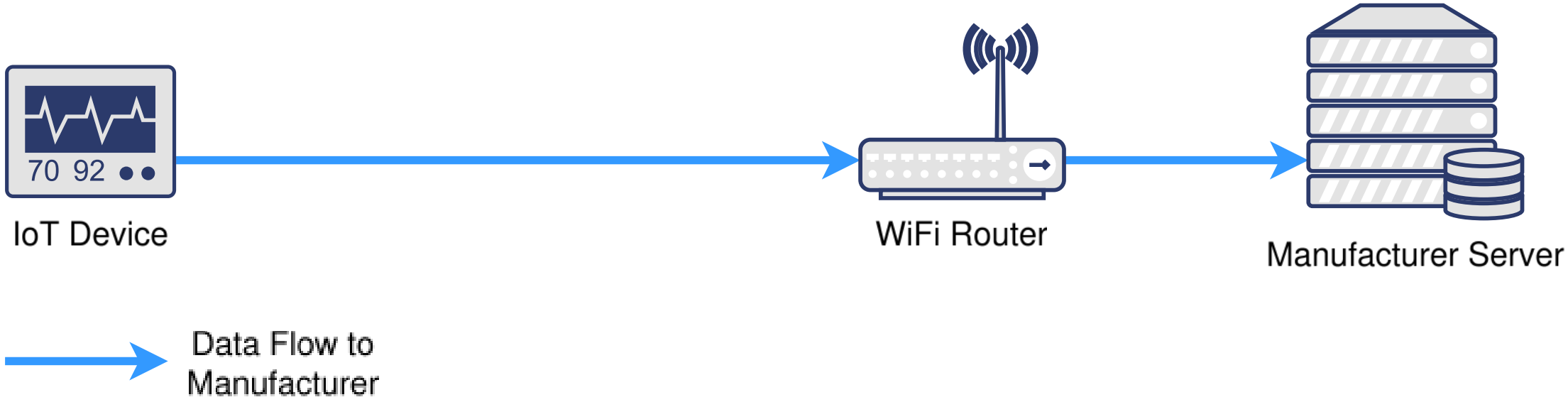
EU Data Act - Main Goals

- Cloud interoperability
  - Cloud switching
  - Customer support for switching providers
  - Bussiness continuity
  - Smoth data migration
  - No moving fees (2027 and forward)
- Data Exchange
  - By default
  - Easily
  - Securely
  - Free of charge
  - In a comprehensive structured, commonly used, machine-readable format

Grace periode since: January 2024

Mandatory after: September 2025

Current situation (Smart Home)

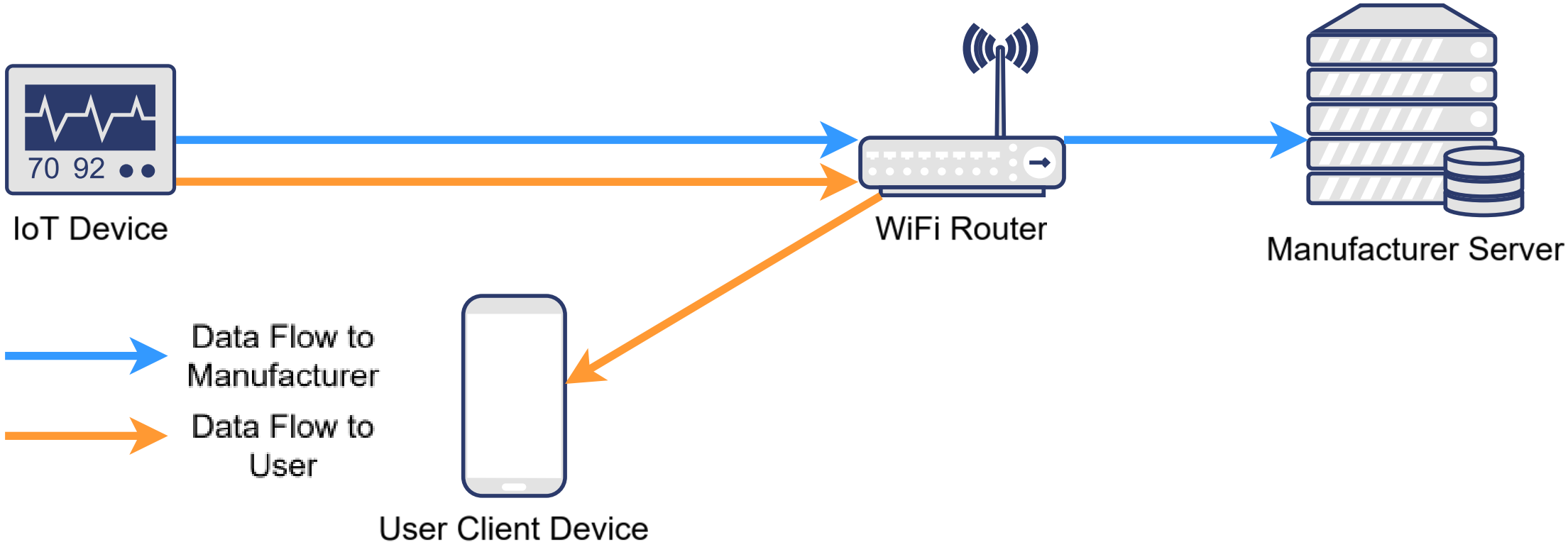


- IoT device sends data to the cloud

Factors for considerations (Manufacturer‘s view)

- One time costs
  - Software implementations
  - Hardware change
- Operating costs
  - Network traffic
  - Power consumtions
  - Computing power
  - Data storage
- Firmware update needed
- Security attack surface
- Battery lifetime

Direct Access

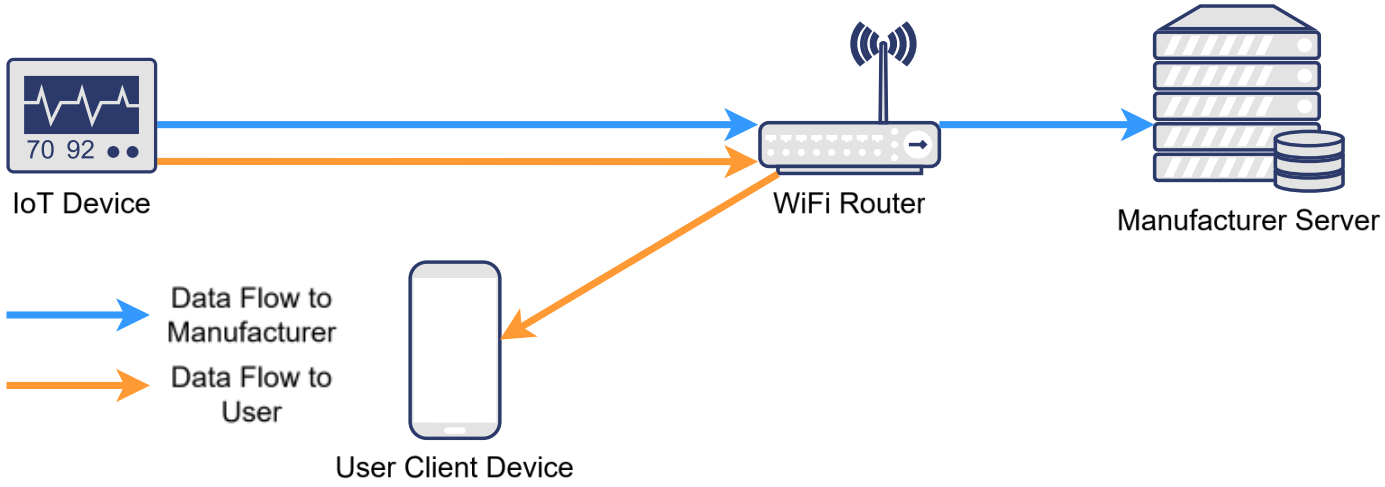


- IoT device sends data to the cloud
- Data pulling from IoT device
- Immediate access

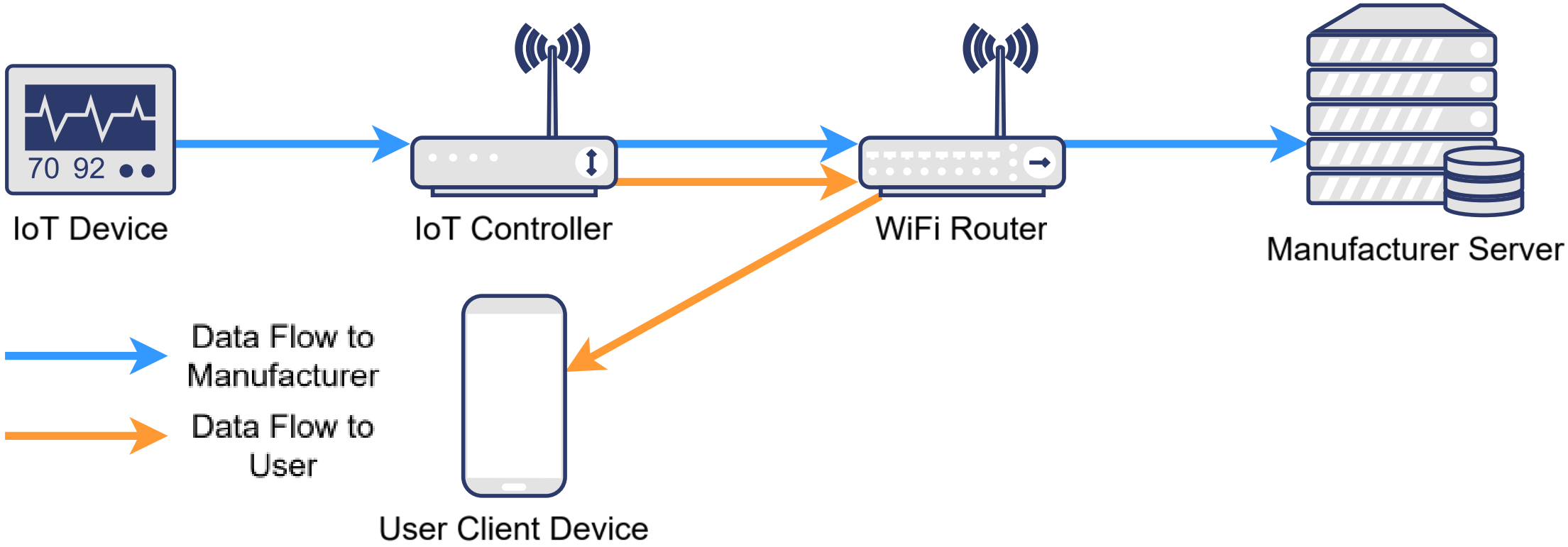
Direct Access – Pro & Contra

- One time costs
  - Software implementations
  - Hardware change
- Operating costs
  - Network traffic
  - Power consumtions
  - Computing power
  - Data storage

- Firmware update needed
- Security attack surface
- Battery lifetime
- No long time data storage



Access via IoT Controller

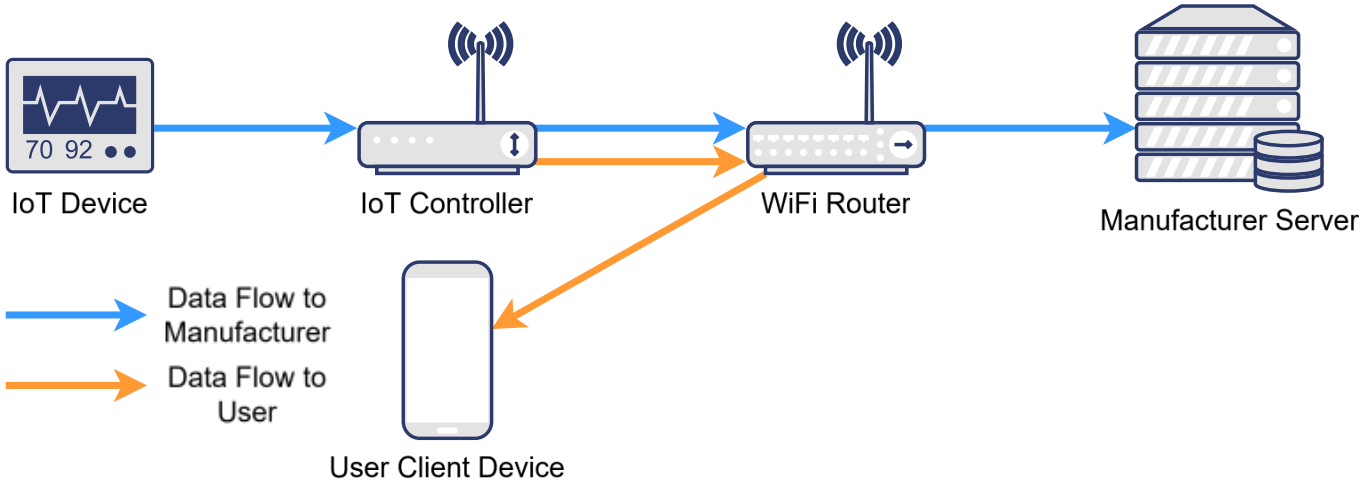


- IoT device sends data to the cloud
- Data pulling from IoT controller
- Immediate access

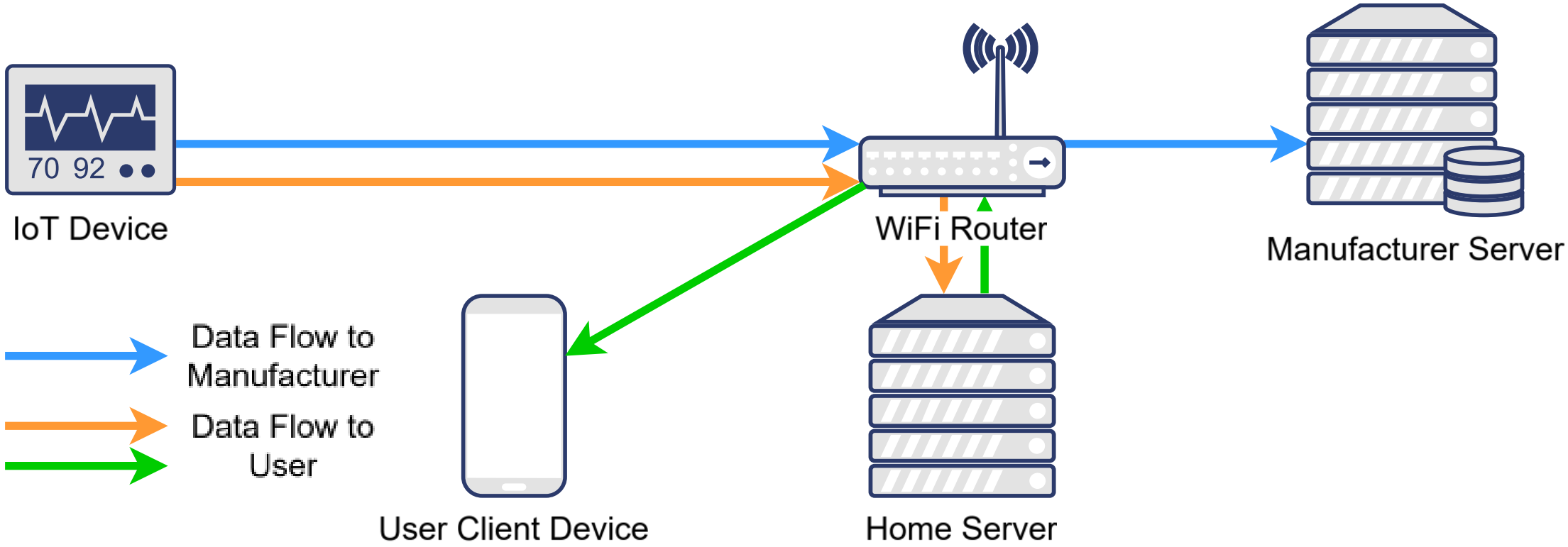
Via IoT Controller – Pro & Contra

- One time costs
  - Software implementations
  - Hardware change (maybe on Controller)
- Operating costs
  - Network traffic
  - Power consumtions
  - Computing power
  - Data storage

- Firmware update needed (on Controller)
- Security attack surface
- Battery lifetime



User Hosted Cloud

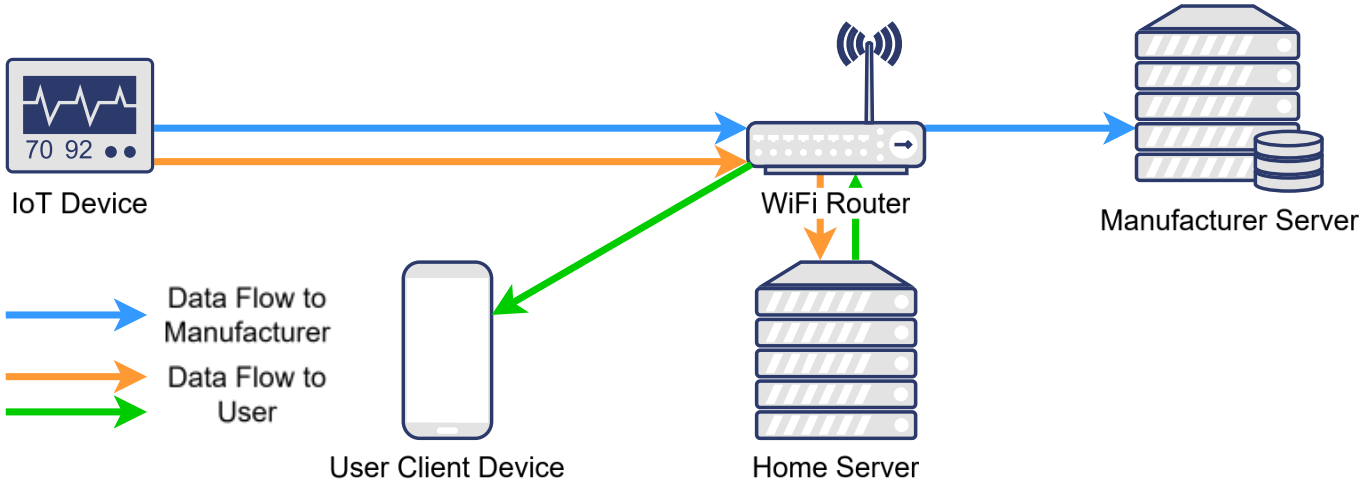


- IoT device sends data to the cloud and local server
- Data pulling from local server
- Access to historical data

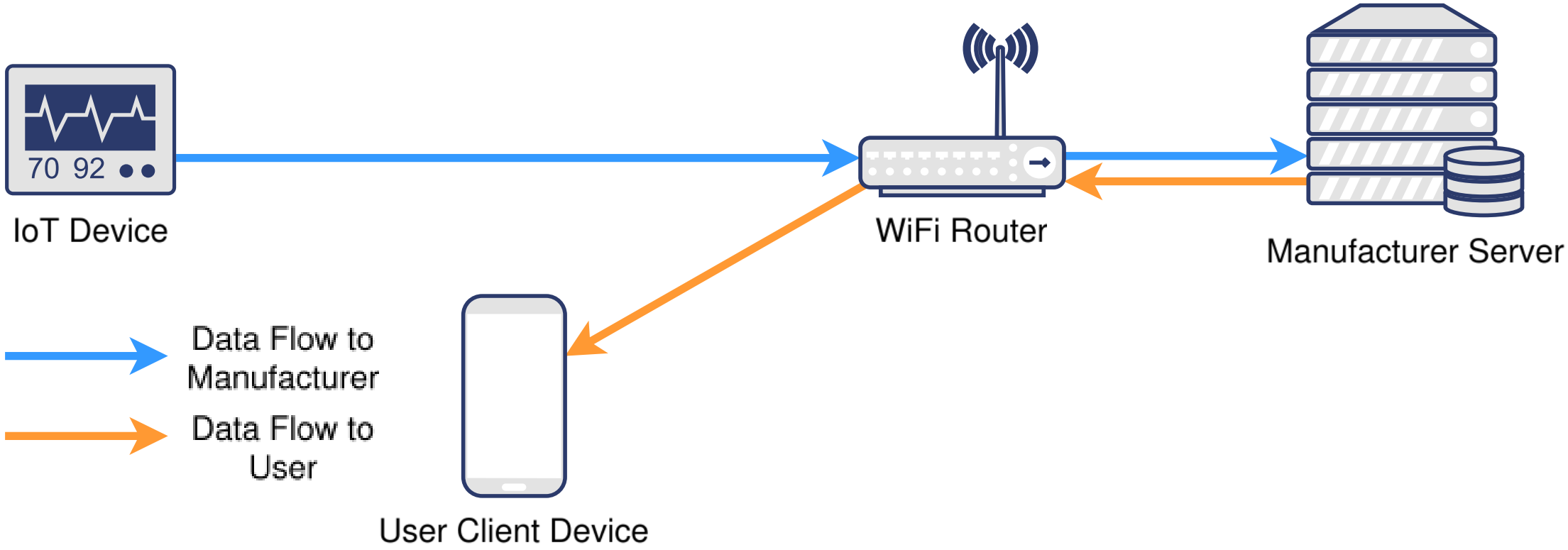
User hosted Cloud – Pro & Contra

- One time costs
  - Software implementations
  - Additional Server Software development
  - Hardware change
- Operating costs
  - Network traffic
  - Power consumtions
  - Computing power
  - Data storage

- Firmware update needed
- Security attack surface
- Battery lifetime



Existing Cloud

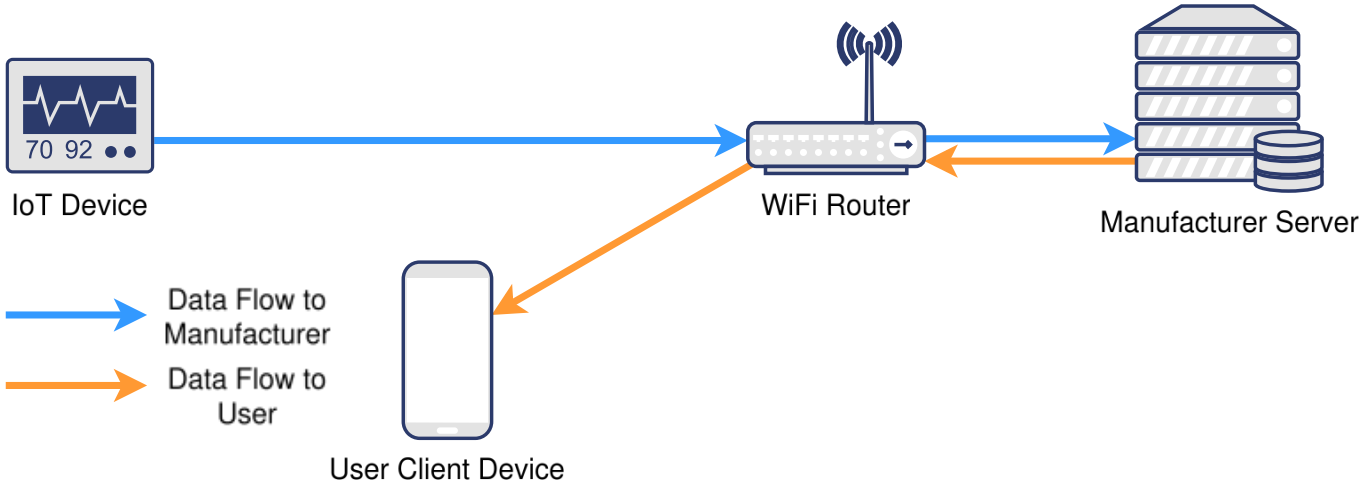


- IoT device sends data to the cloud
- Data pulling from cloud
- Access to historical data

Existing Cloud – Pro & Contra

- One time costs
  - Software implementations
  - Hardware change
- Operating costs
  - Network traffic
  - Power consumtions
  - Computing power
  - Data storage

- Firmware update needed
- Security attack surface
- Battery lifetime



Conclusion

- Multible ways for fullfillment of EU Data Act possible
- Main factors to consider for implementations
  - Firmware update possible
  - Operating costs
  - Keeping the functionality of IoT devices (battery life)
- Using existing cloud is easiest to implement in most cases

Future Work

- Demonstration of implementations
- Other scenarios
  - Connected cars
  - Industrial machines
  - Cloud services
  - Software on Home Computers
- Analyse the implementations of manufacturers
- Cloud Switching → Contacts?

Obrigado

https://forensik.hs-mittweida.de/

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