

Internet Technologies RG

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Themen der AG iNET

Protokolle & Standards
Anwendungen & Analysen
Sicherheit & Zuverlässigkeit

im Internet

Forschung zum Mitmachen

Bei INET arbeitet man **international**:

- ▶ März 2019: NetSys (München)
- ▶ März 2019: IETF mit Hackathon (Prag)
- ▶ April 2019: IEEE IoT World Forum (Limerick)
- ▶ Mai 2019: IoThon (Helsinki)
- ▶ Mai 2019: RIPE Meeting (Island)
- ▶ Juli 2019: IETF (Montreal)
- ▶ September 2019: RIOT Summit (Helsinki)
- ▶ September 2019: ACM ICN (Hongkong)
- ▶ Oktober 2019: IEEE LCN (Osnabrück)
- ▶ Oktober 2019: ACM IMC (Amsterdam)
- ▶ November 2019: SenSys (New York)
- ▶ November 2018: IETF (Singapur)

Contribute

~~Be Influential~~

Relevant!

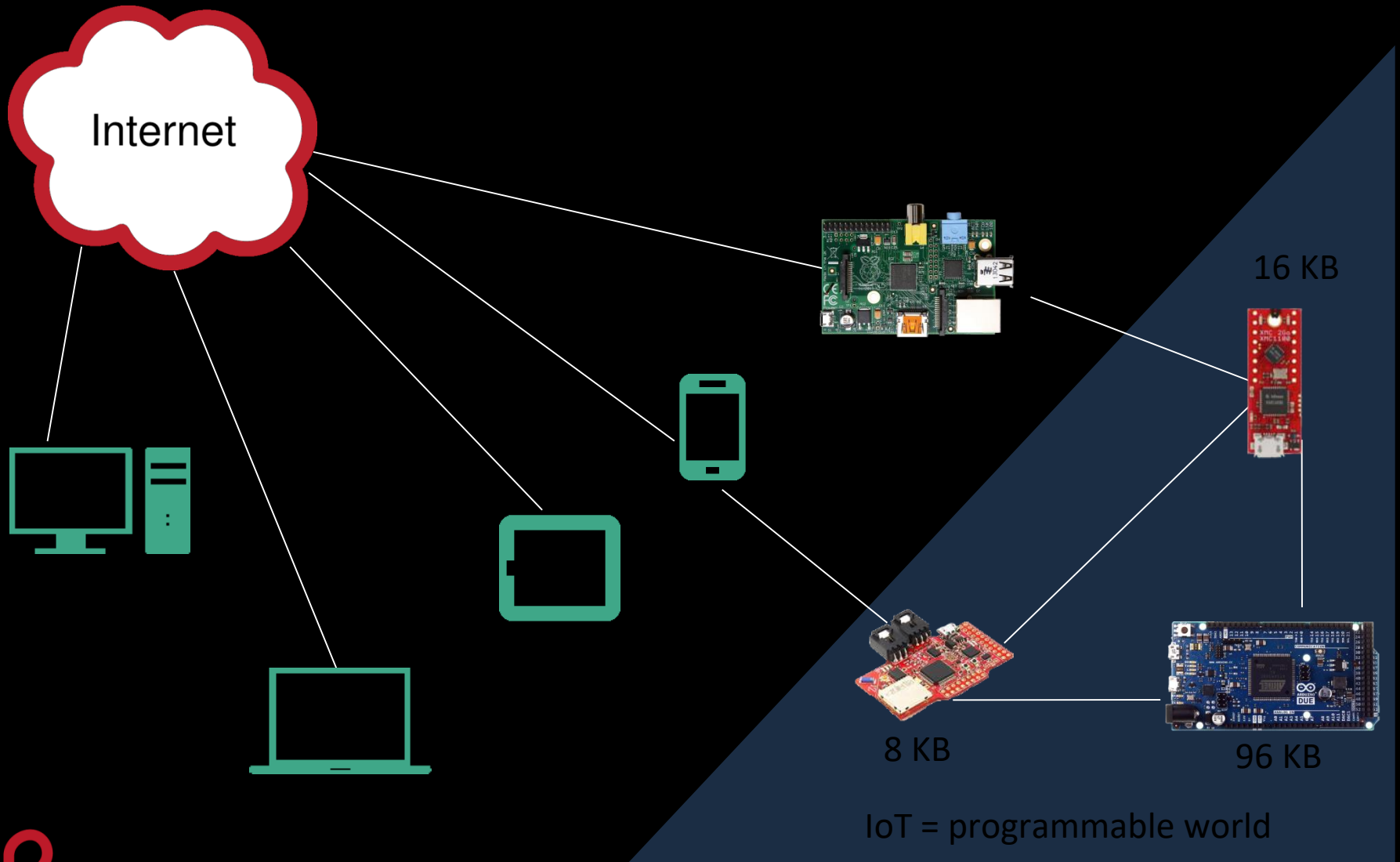
Laufende Forschungsprojekte

- **RAPstore** – RIOT App-Store für IoT-Anwendungen
- **I3** – Industrielles Informations-zentrisches Internet: Sensorkommunikation auf Ölplattformen mit RIOT
- **X-Check** – Sicherheits-Monitoring an Internet Exchange Points
- **MONICA** – Management Of Networked IoT Wearables
- **SANE** – Smart Urban Sensing
- **SecVI** – Sicherheit im Autonomen Fahren

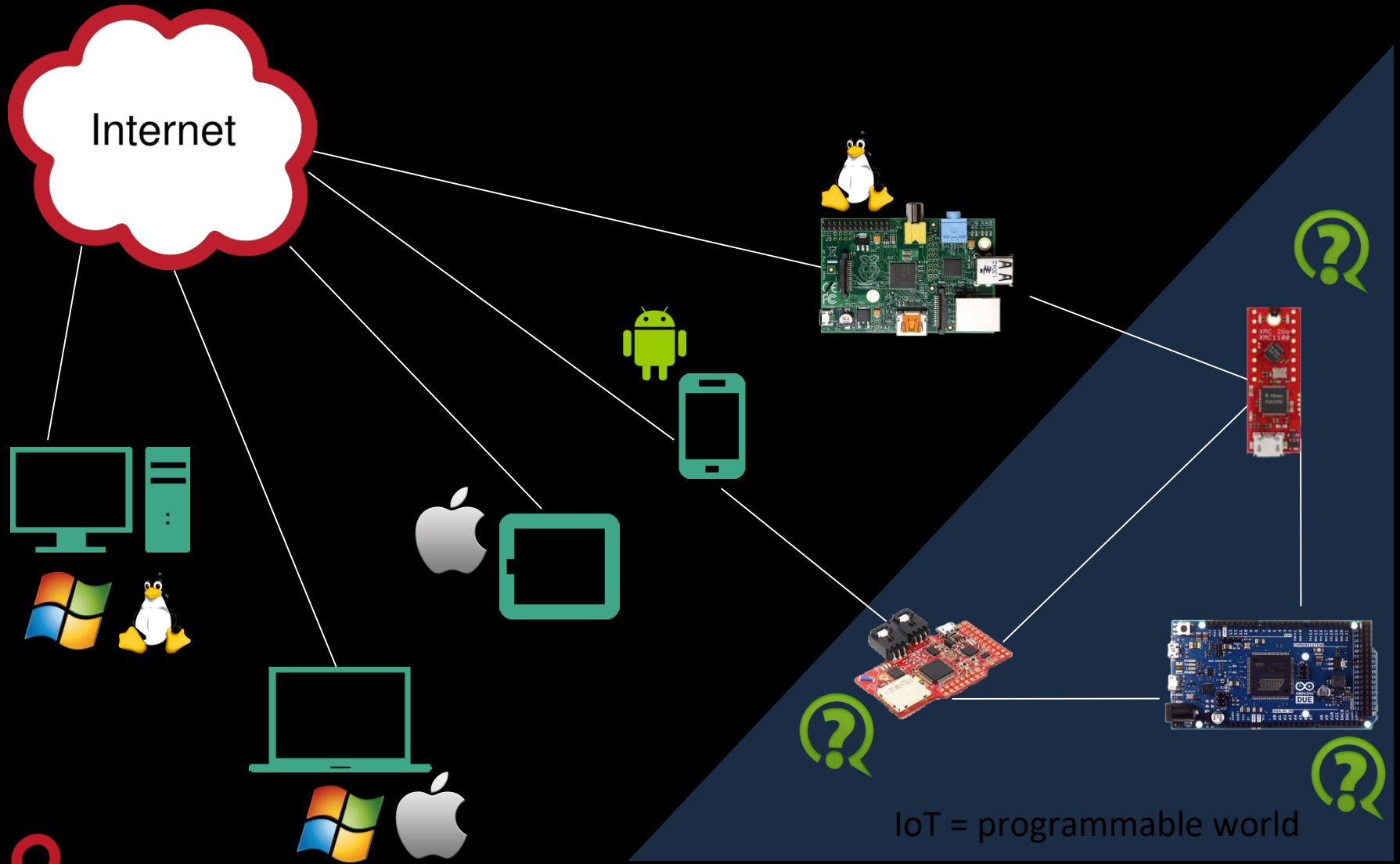
Im Fokus: Open Source Software

- Laufende Projekte mit großer Sichtbarkeit
- Aktive Communities
- Lebendig & nachhaltig
- Impact erzeugen
 - Mitgestalten
 - Ergebnisse veröffentlichen
 - Mit Anwendern arbeiten

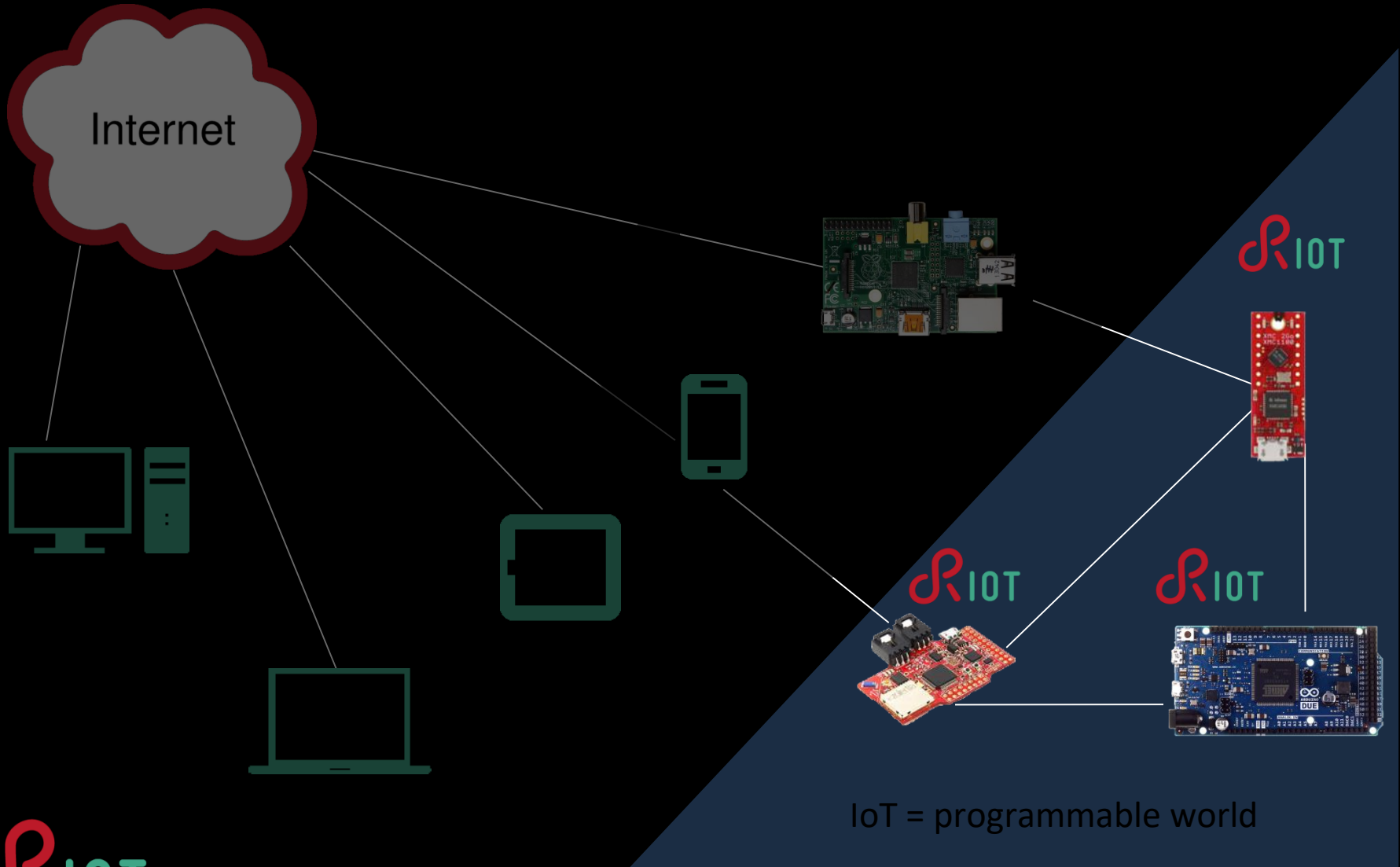
The Internet of Things (IoT)



IoT: The operating system question



RIOT: The friendly IoT operating system





Founded by

RIOT

The friendly Operating System for the IoT

IoT Friendly
The best standards designed for the Internet of Things.

Hardware for Embedded Systems



RIOT

The friendly Operating System for the IoT

Versatile
Only use the components you need. Code once, runs on multiple platforms.

- Runs on 8-bit AVR, 16-bit MSP430, 32-bit MIPS, PIC32, ARM7 and Cortex-M
- Vendor-independent support for MCUs by TI, MSP, STM, Nordic, Atmel, Silicon Labs
- Real-time capable
- Priority-based, tickless scheduler

Open Source & Open Standards
Benefit from free, LGPL, licensed components and become part of a welcoming community.

WIRESHARK



Join the RIOT

- World-wide, open source community
- A **really large** open source project
- ~750 forks on GitHub <https://github.com/RIOT-OS/RIOT>
- Hundreds on the developer mailing list: devel@riot-os.org
- Developers from Asia, Europe, North America, South America
- Support & discussions on IRC: [irc.freenode.org #riot-os](irc://irc.freenode.org/#riot-os)



CAF

C++ Actor Framework

Scalability

Efficient distribution

Efficient calculations

Across hardware

Across networks

C++ Library – Work-stealing Scheduler – OpenCL Binding

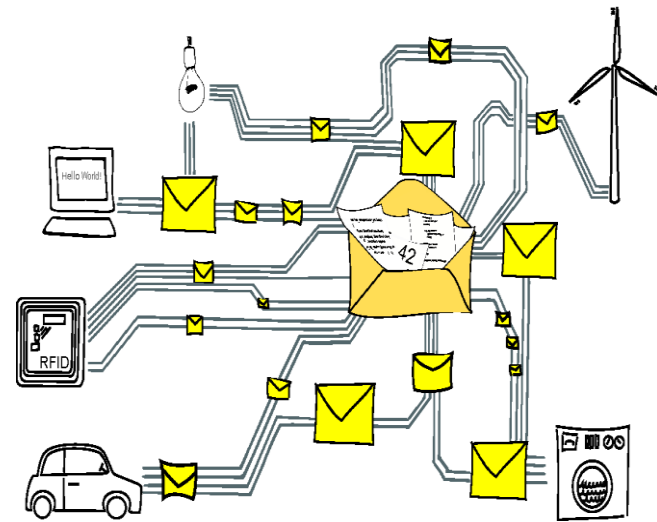
Open Source – TCP/UDP/CoAP – ACTORS!



Global skalierbare, verteilte Programmierung

Problem: Verteilte zuverlässige Programmierung in einer heterogenen Welt

- C++ Actor Framework (CAF)
 - Zuverlässiges Message Passing
 - Skalierbarkeit & Sicherheit
 - Open Source Community
- CAF hat industrielle Anwender
 - Vast + BRO / Paxson Group, Berkeley
 - Dual Universe / Novaquark, Paris



Weitere Open Source Software@INET

- **RTRlib** - BGP Prefix Origin Validation (RPKI)
 - Standard Referenz-Implementierung
- **RPKI Tools** – Monitoring von RPKI
 - Sicherheits-Werkzeuge für das Internet Backbone
- Ad hoc On-Demand Distance Vector Routing
 - **AODVv2** Standard Referenz-Implementierung
- **Mcproxy** – Multicast Proxy Daemon
 - Vielfacher industrieller Einsatz (→ Qualcomm)



Wie weiter?

Individuelle Sprechstunde

“Mein Forschungsthema im Master”

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