

# POSTER:

## In the Room Where It Happens: Characterizing Local Communication and Threats in Smart Homes

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### Abstract

The network communication between Internet of Things (IoT) devices on the same local network has significant implications for platform and device interoperability, security, privacy, and correctness. Yet, the analysis of local home Wi-Fi network traffic and its associated security and privacy threats have been largely ignored by prior literature, which typically focuses on studying the communication between IoT devices and cloud end-points, or detecting vulnerable IoT devices exposed to the Internet. In this paper, we present a comprehensive and empirical measurement study to shed light on the local communication within a smart home deployment and its threats. We use a unique combination of passive network traffic captures, protocol honeypots, dynamic mobile app analysis, and crowdsourced IoT data from participants to identify and analyze a wide range of device activities on the local network. We then analyze these datasets to characterize local network protocols, security and privacy threats associated with them. Our analysis reveals vulnerable devices, insecure use of network protocols, and sensitive data exposure by IoT devices. We provide evidence of how this information is exfiltrated to remote servers by mobile apps and third-party SDKs, potentially for household fingerprinting, surveillance and cross-device tracking. We make our datasets and analysis publicly available to support further research in this area.

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### REFERENCES

- [1] Aniketh Girish, Tianrui Hu, Vijay Prakash, Daniel J. Dubois, Srdjan Matic, Danny Yuxing Huang, Serge Egelman, Joel Reardon, Juan Tapiador, David Choffnes, and Narseo Vallina-Rodriguez. In the room where it happens: Characterizing local communication and threats in smart homes. In *Proceedings of the 2023 ACM on Internet Measurement Conference, IMC '23*, page 437–456, New York, NY, USA, 2023. Association for Computing Machinery.

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