AN ANALYSIS OF TRUST IN SMART HOME DEVICES

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Outline

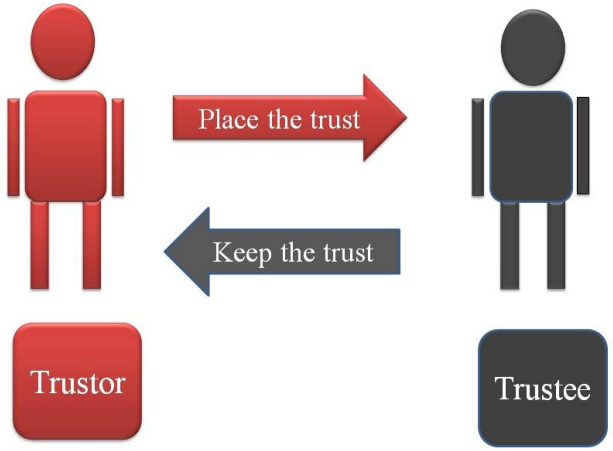
- Introduction
- Motivation
- Use Case
- Findings
- Trust Model
- Conclusion

Introduction (Trust)

Trust is difficult to define because:

- “Trust is a multidimensional, multidisciplinary and multifaceted concept” (Yan et al., 2008)

- “The personal, unique and temporal expectation that a trustor places on a trustee regarding the outcome of an interaction between them” (Moyano et al., 2012)



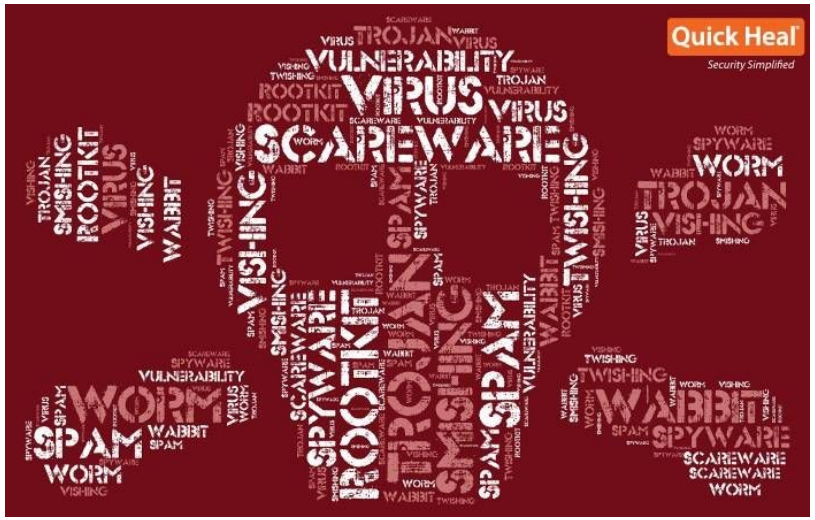
Introduction (IoT)

- IoT
  - Connection “everywhere”
  - Remote Control
  - Protocols (Many)
  - Low protection
  - Low computation power

- Smart Home security enhanced by Trust

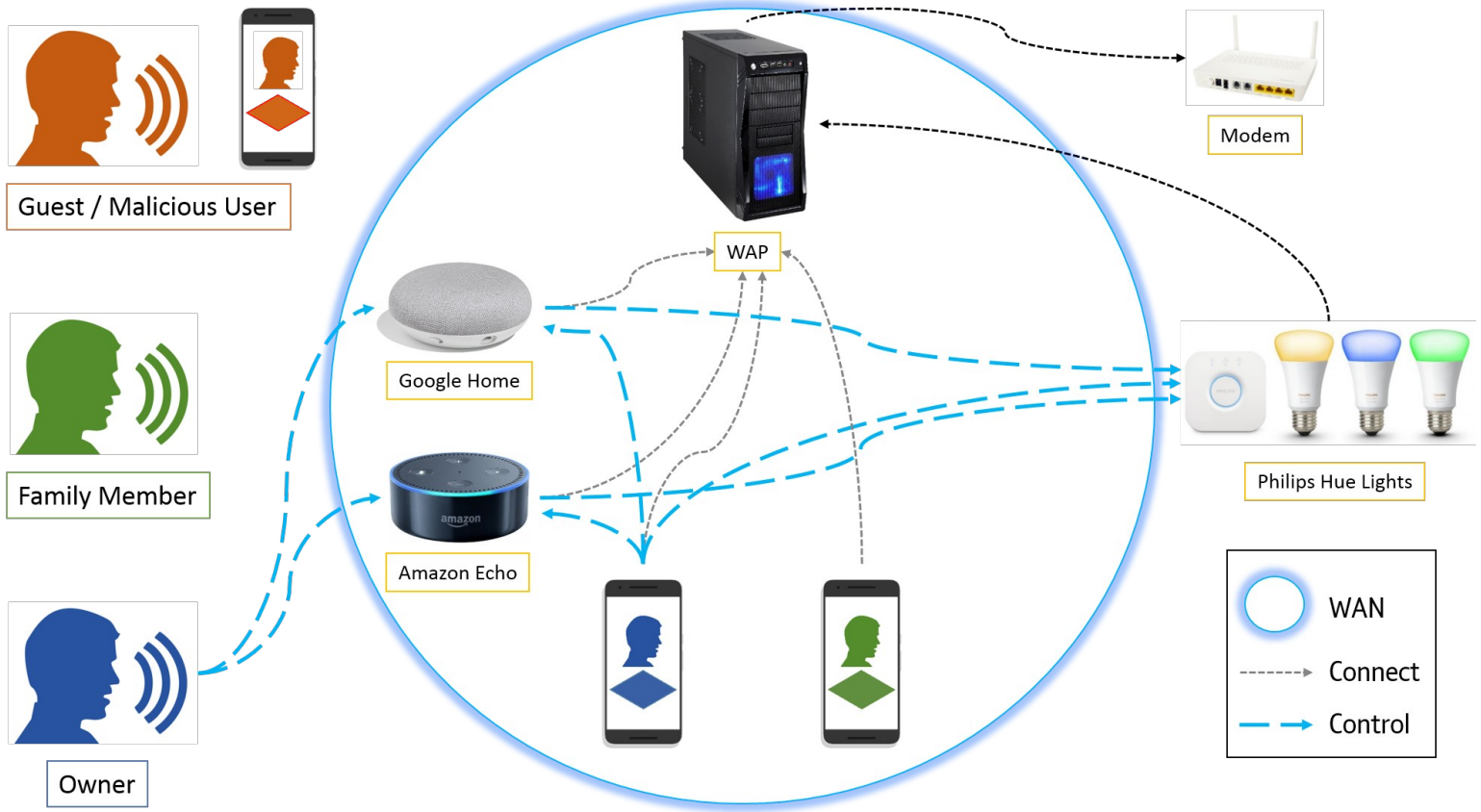
Motivation

VS.



Use Case

- Smart Home Scenario
- Users
- IoT Devices

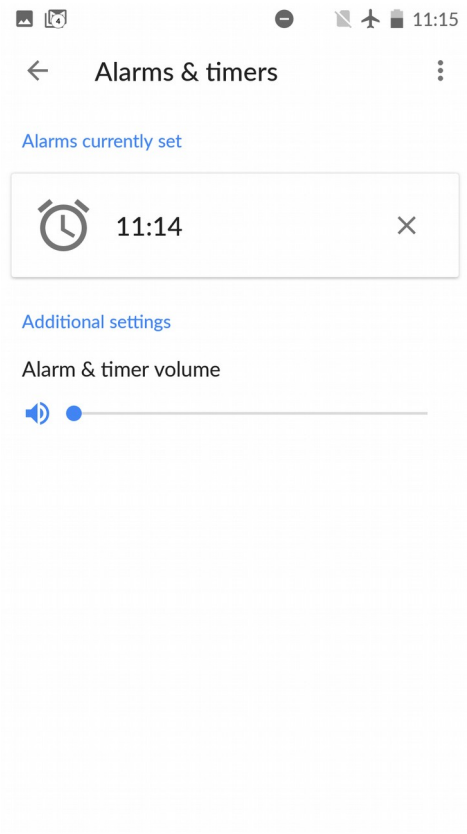


Findings

- Alexa (Only the owner can see what is going on through the smartphone app)
- Google (Too much trust for the connected users, every connected user can see what is going on and can cast commands)
- Google (Wi-Fi steal) Anytime the Wi-Fi is not available the device creates a WAP that allow any user to configure it. (Not ownership)
- Hue (Some details are revealed in clear: Bridge ID, IP, commands)

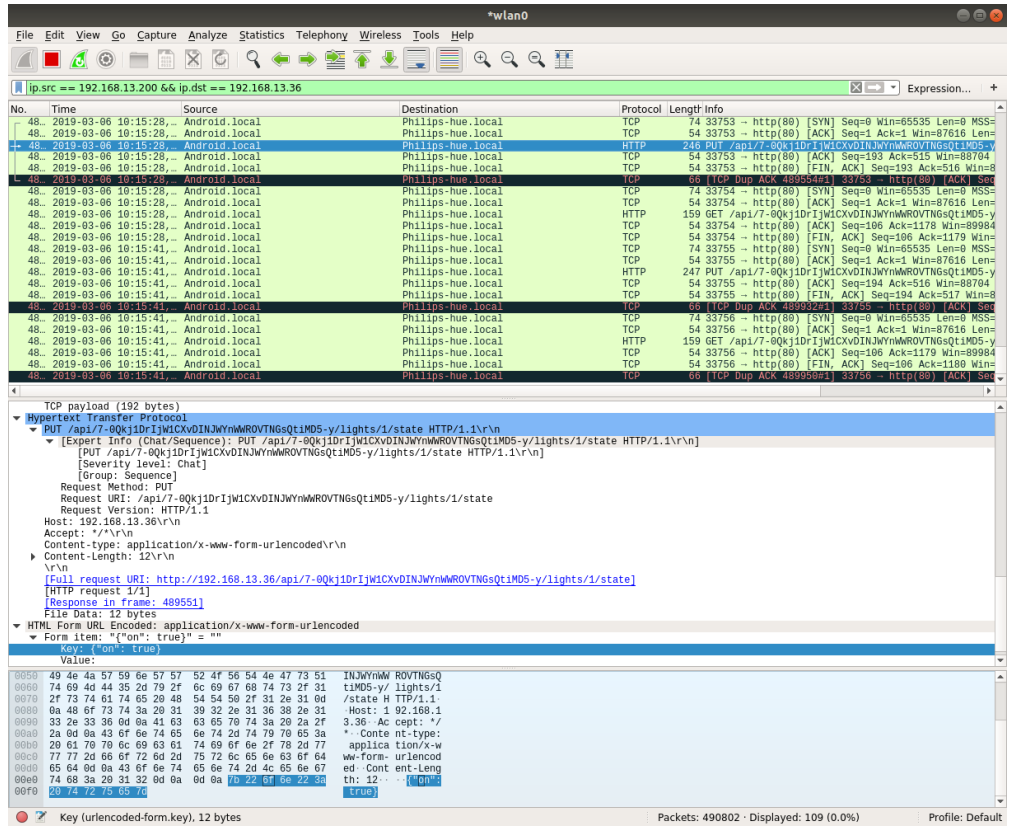
Findings

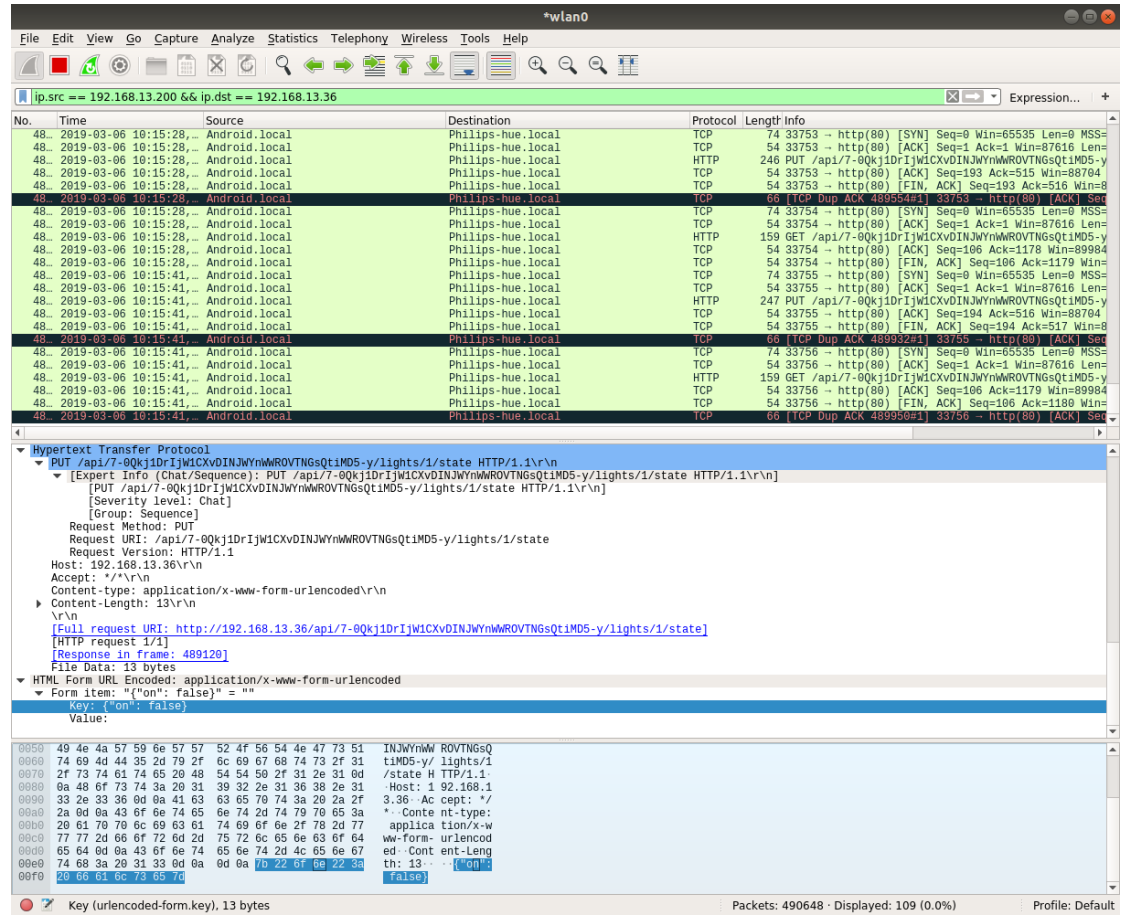
- Google



Findings

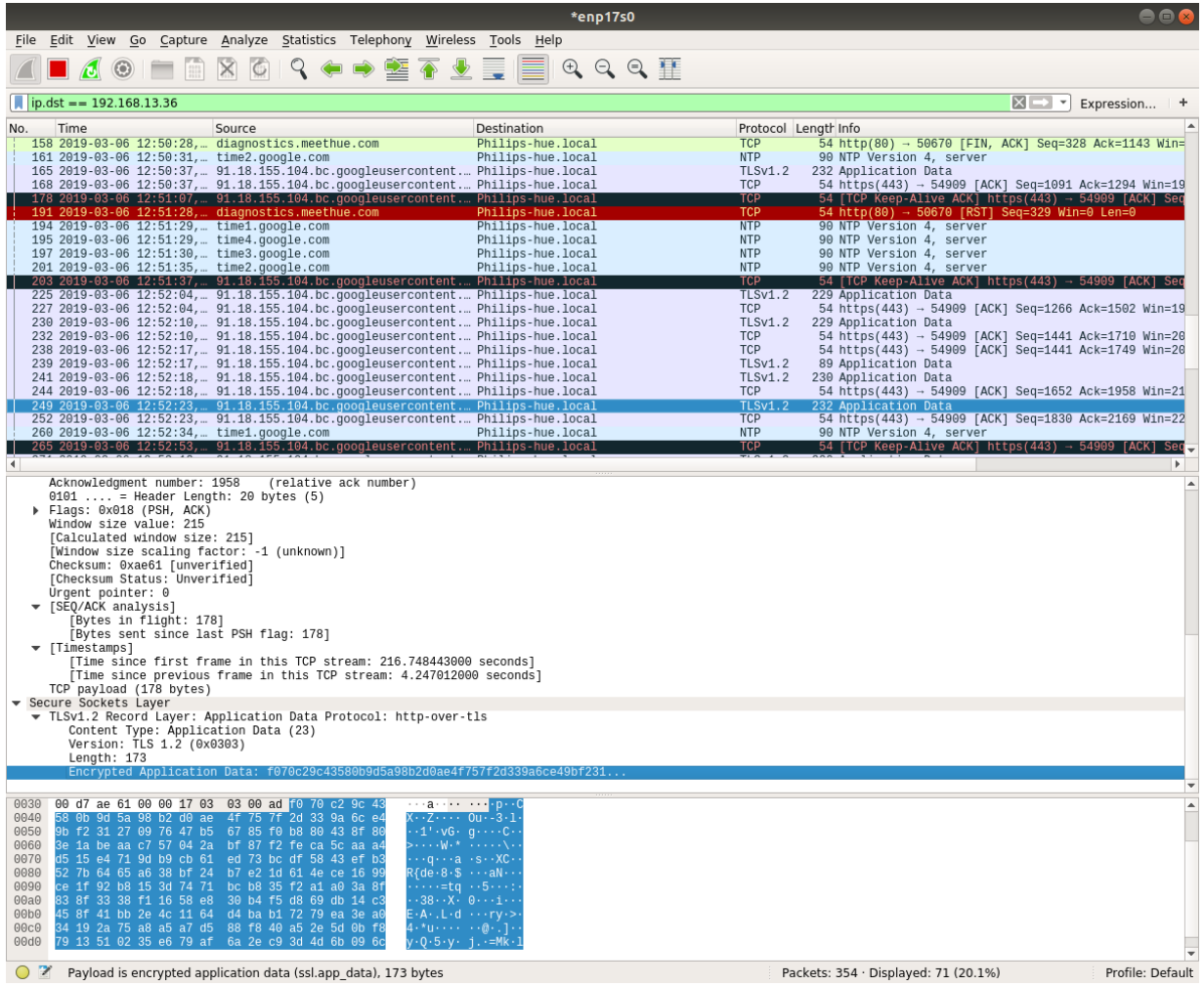
- Alexa & Hue





Findings

- Google & Hue



Trust model

How the system is? Improvements?

- Google: Trust in the users, (set-up) security must be improved
- Alexa: Less trust in the other users, (set-up) security can be improved
- Hue: “Physical” trust, (set-up) good security measure

Trust Model

- Role: HO, HM, HG, MU
- Context: {1,2,3,4}
- Score: {0,1,2,3,4,5}

- Trust Metric : TM(Role, Context, Score)

How it works? Subtraction of Score and Context to decide if a user is allowed to do something.

Trust Model

- Trust Metric : TM(Role, Context, Score)
- Possible values (Negative, Zero, Positive)
- Negative (No actions are allowed for the particular context)
- Zero (You can only check what is going on)
- Positive (You are trusted enough to cast commands)

Conclusion

- Different trust models related to Alexa, Google and Hue
- Improvement is needed
- Improvement proposed

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Questions?

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