24-Mar-2020

A Privacy-Centered System Model for Smart Connected Homes

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THE SMART CONNECTED HOME



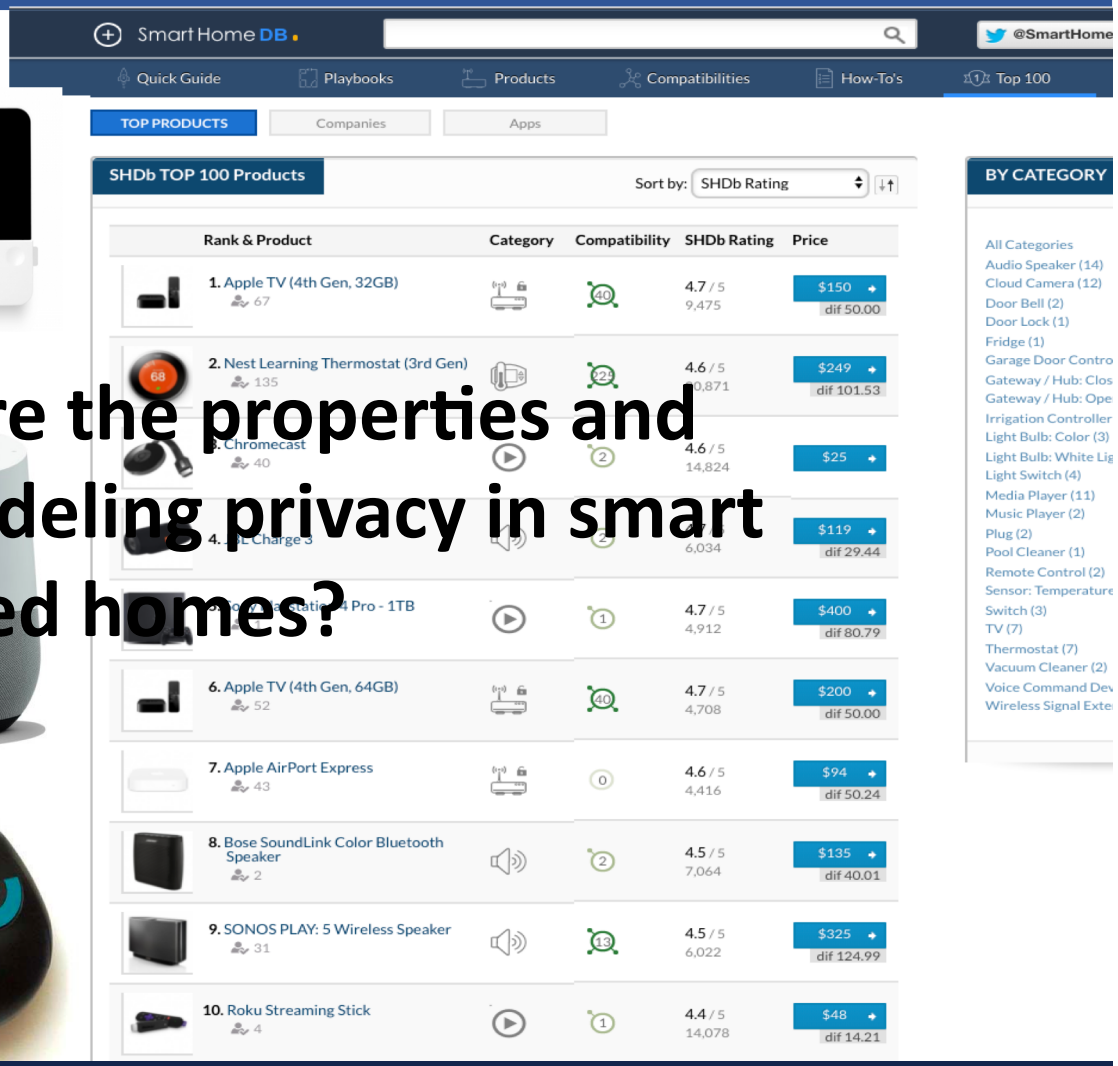






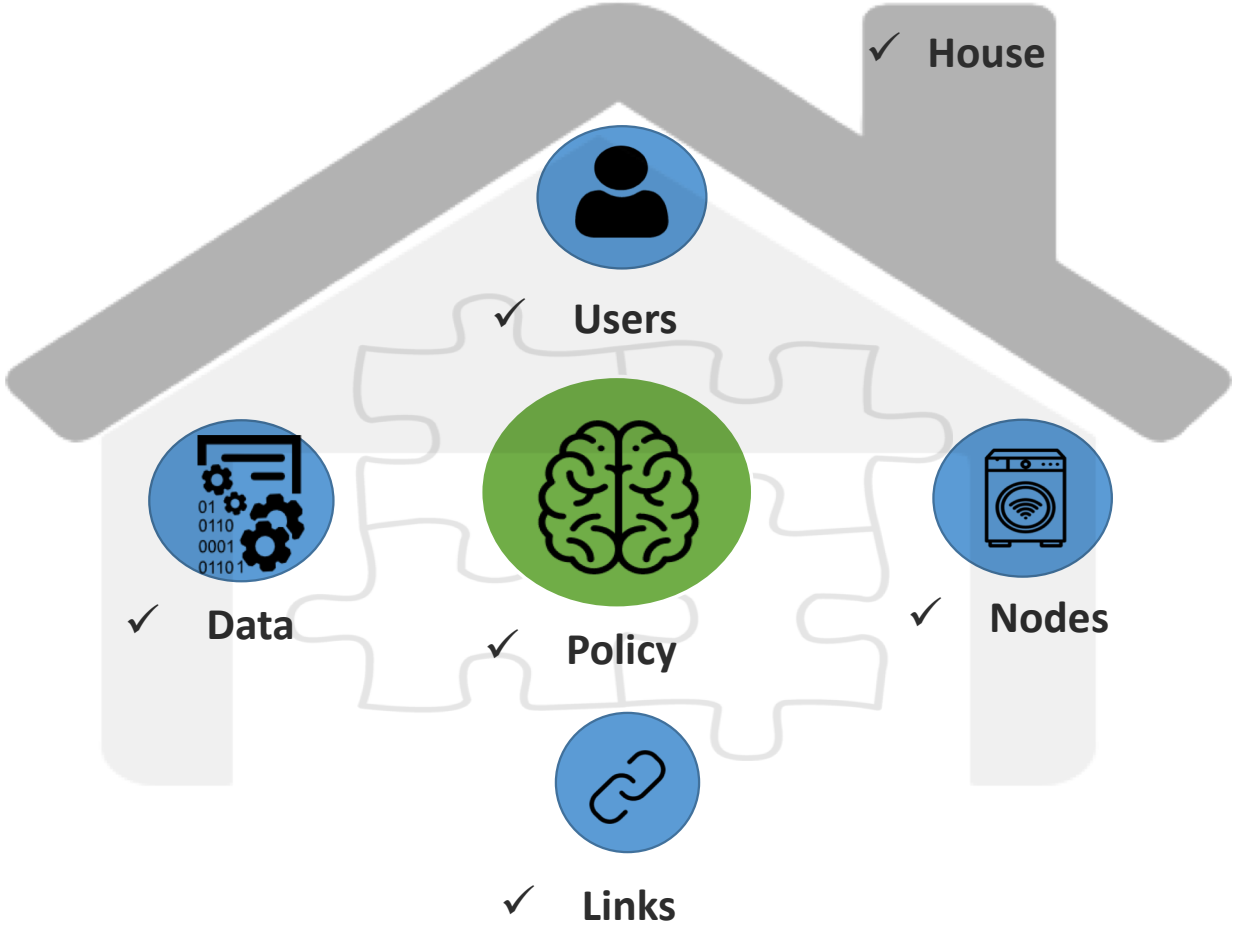


How can we capture the properties and requirements for modeling privacy in smart connected homes?

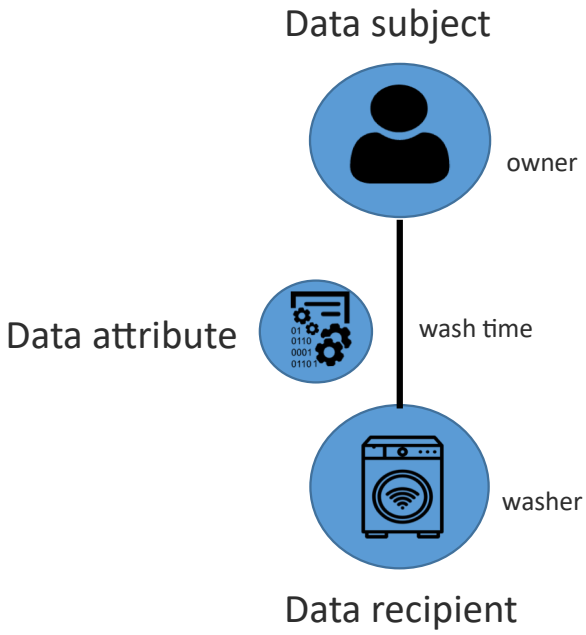


THE PRIVACY-CENTERED SYSTEM MODEL

- ✓ The smart connected home system model



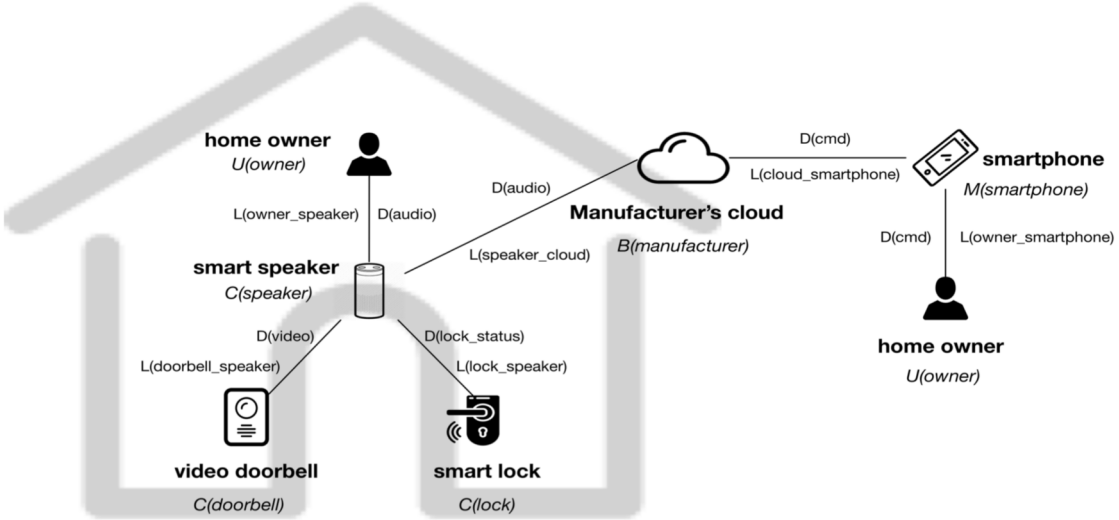
- ✓ Leveraging the theory of *Contextual Integrity** as a definition of privacy



* Nissenbaum, Helen. "Privacy as contextual integrity." *Wash. L. Rev.* 79 (2004): 119.

PRIVACY THREAT IDENTIFICATION IN ACTION

✓ Privacy-centered model of the smart connected home



Policy, $P =$
$\{(doorbell\_speaker, \{(video, \{read\})\}, doorbell, speaker, \emptyset),$
$(lock\_speaker, \{(lock\_status, \{read\})\}, lock, speaker, \emptyset),$
$(speaker\_cloud, \{(audio, \{read\})\}, speaker, manufacturer,$
$Time = \{8:00 - 24:00\} \wedge Location = \{house\}),$
$(cloud\_smartphone, \{(cmd, \{read\})\}, smartphone,$
$manufacturer, \emptyset),$
$(owner\_smartphone, \{(cmd, \{read\})\}, owner, smartphone, \emptyset),$
$(owner\_speaker, \{(audio, \{read\})\}, owner, speaker, \emptyset)\}$

✓ Using high-order logic formulas to identify threats

Identification ●

Profiling ●

Localization and Tracking ○

○ **Threat does not exist**

◐ **Threat is a potential future threat**

● **Threat is present**

NEXT STEPS

✓ Evaluate the **completeness** of the proposed model

✓ Express the system model using a **formal specification** language

✓ Leverage the model for performing **quantitative risk analysis**

THANK YOU FOR *YOUR* ATTENTION !

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