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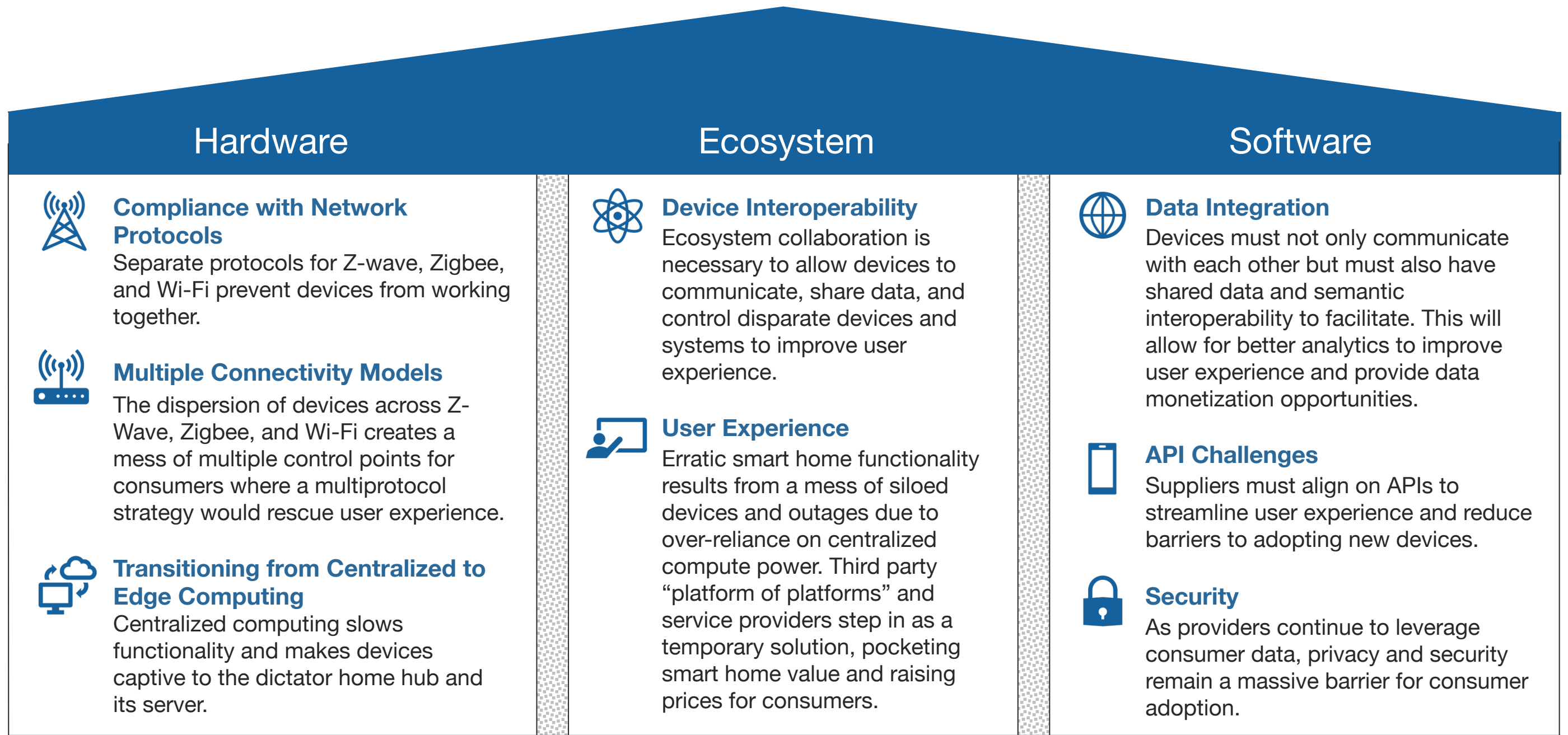
# The Key to Unlocking Smart Home Ecosystems

# Executive Summary

- 1 The growth of the Smart Home market is being stifled by the messy aggregation of network protocols, software incompatibility, and winner-take-all attitudes by the main players.
- 2 The current Smart Home landscape reflects a “hub and spoke” or dictator-like relationship where “spoke” devices are increasingly at the mercy of Amazon, Google, and other smart speaker platforms.
- 3 These hardware and software challenges have increased cost and complexity for both smart home suppliers and consumers, restricting innovation for suppliers and creating a frustrating user experience.
- 4 Therefore, to unleash the full future potential of the Smart Home, the following maneuvers are likely needed:
  - a Increased attention to driving network protocol standardization
  - b Increased priority placed on software interoperability by tech suppliers
  - c Movement of architectures from dictator to a localized ecosystem
  - d Increased distributed edge computing to increase reliability and user experience satisfaction
- 5 If players address these challenges, the Smart Home market has the potential to reach \$66.5 billion in 2023 and a 20.9% growth rate.

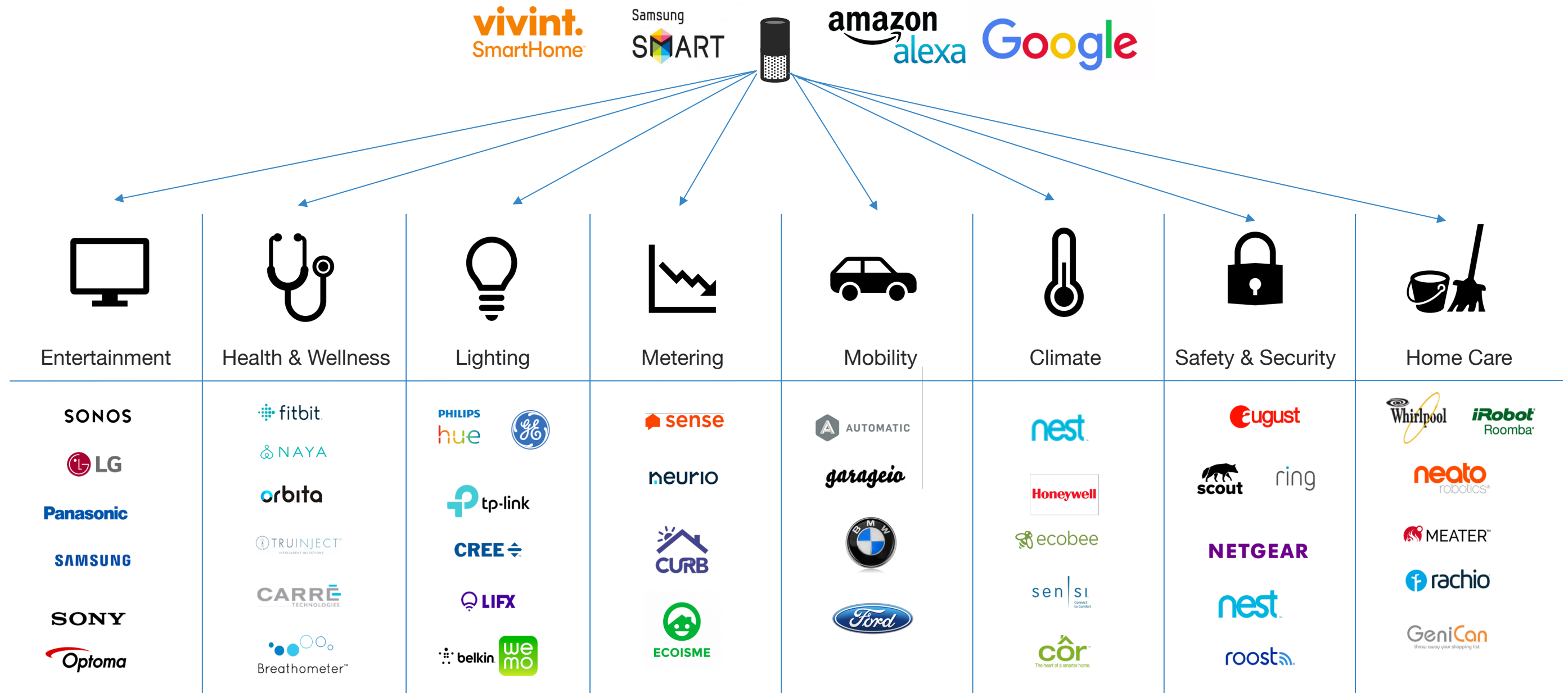
# Current Landscape Endangers the Future of Smart Home

If tech suppliers don't shift toward pervasive interoperability, user experience will continue to collapse for everyone



# Smart Speaker Platforms Dominate the Home

Ancillary devices are forced into reliance on home hubs for the keys to user experience, namely connectivity, compute power, and NLP capabilities

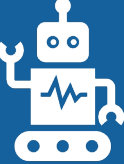













# Dictator Smart Home Architecture Dampens Market Growth

The hub-and-spoke model employed by Amazon, Google, and other smart speaker platforms restrains both entry by new “spokes” and adoption by consumers



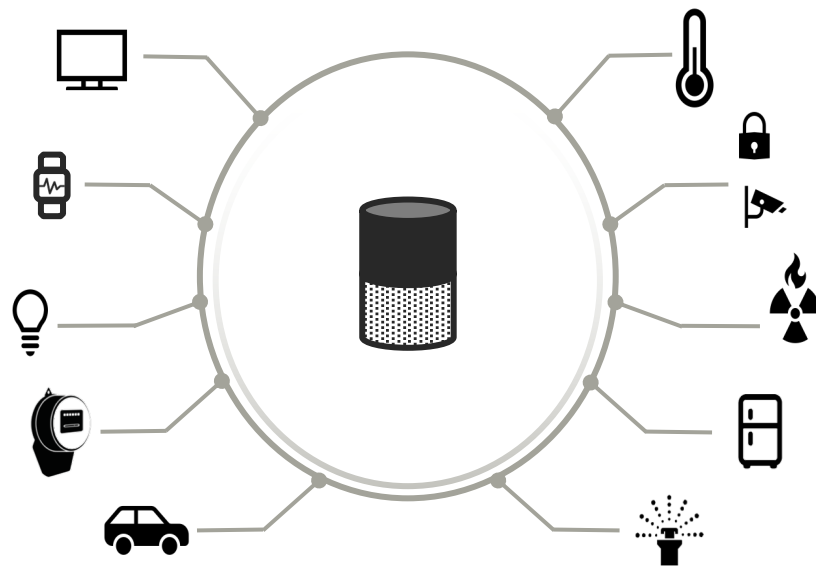
**The Dictator Model** involves one Smart Home hub through which all devices are controlled. Devices cannot communicate with each other without the help of the dictator or hub, and hubs from different providers or in different systems (eg: the kitchen vs. the bathroom) do not communicate with each other

 Impacts on Device Suppliers	 Impacts on User Experience
 Barriers to Entry	 Device Cost
 Hardware Costs	 Complexity
 Developer Costs	 Adoption
 Bargaining Power	 Ease of Use
 Specification Influence	 Ease of Installation

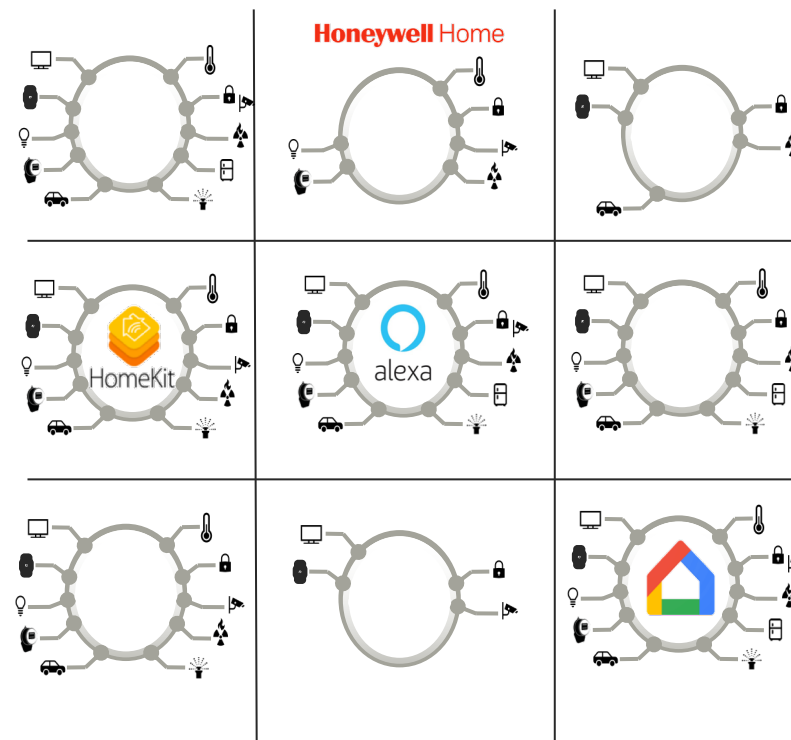
# A Shift Towards a Local Ecosystem Saves Cost and Improves UX

The transition to mesh will allow for better, cheaper, more reliable products that are easier to install and maintain

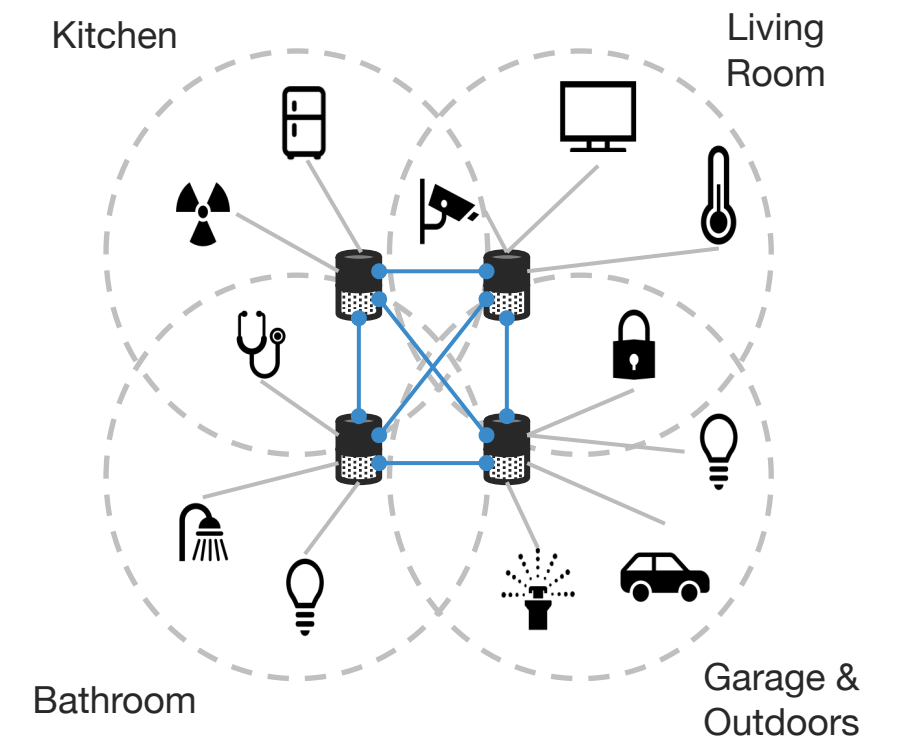
## Dictator



## Walled Garden



## Mesh Ecosystem



# Case Study: Kohler Creates A Bathroom Ecosystem

Kohler has created a local ecosystem of devices that serve the consumer in tandem but are still able to communicate with other systems in the home through partnerships with Smart Home hubs

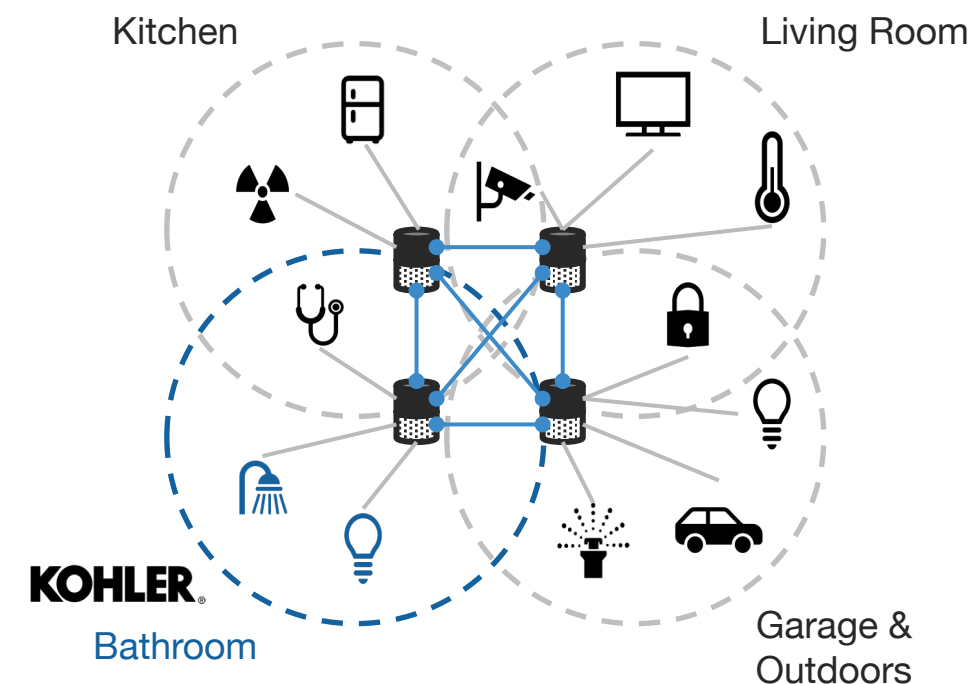
# KOHLER®

An incumbent equipment manufacturer for bathroom and other home products successfully tackles the Dictator model

## “Kohler Konnect” Product Suite

- **Verdera Voice Lighted Mirror:** Allows users to adjust lighting, play news/music, start coffee while getting ready for the day
- **DTV + Shower:** Voice control shower controls temperature, sets timed showers to save water
- **Numi Intelligent Toilet:** voice control heating seat and floor panel where feet rest

## Kohler’s Role In The Future Smart Home:

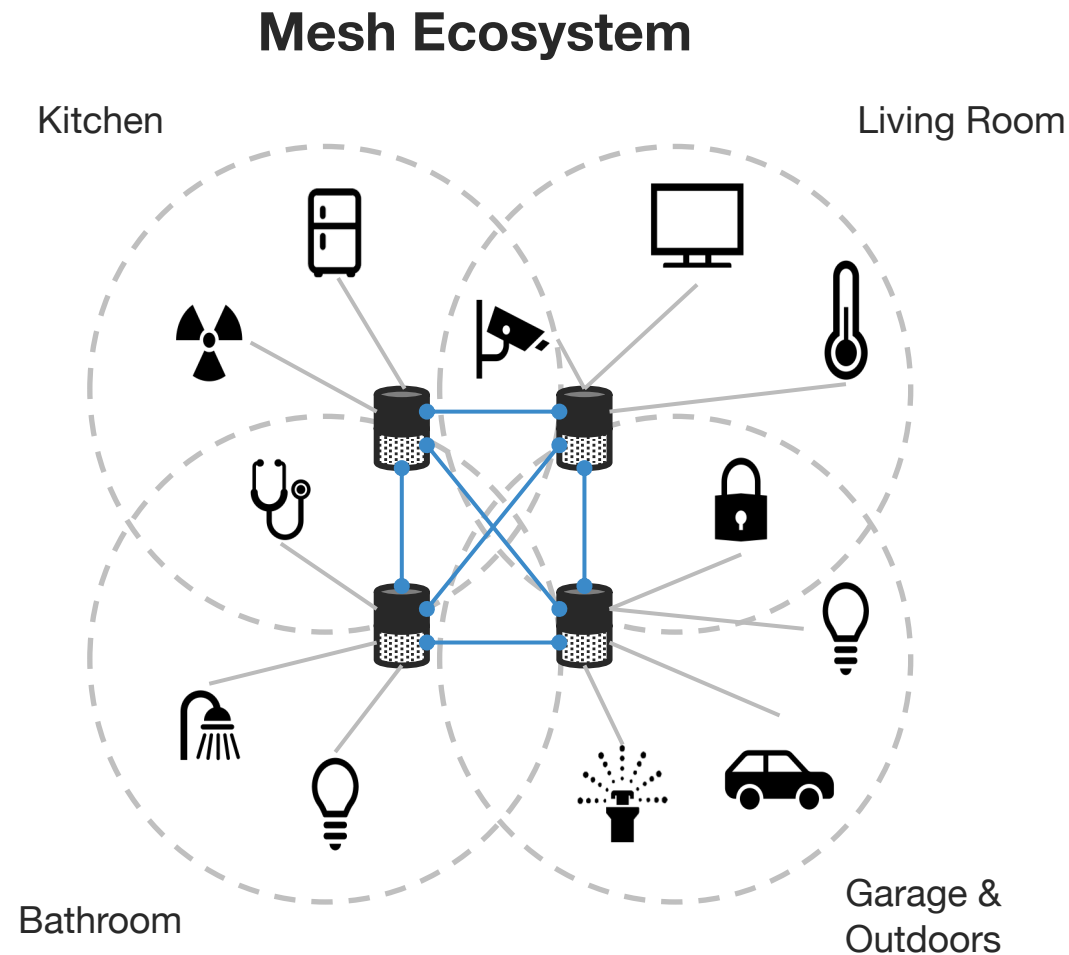


## Takeaways

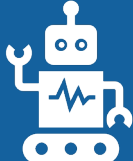










- Companies are able to establish a localized ecosystem in their domain (Kohler – the bathroom) while also establishing connection to the entire Smart Home

# Mesh Ecosystems Cultivate Supplier Innovation and Engage Users

A more localized, intentional ecosystem where systems connected to different hubs in different rooms can all communicate will improve user experience and innovation by new entrants



**A Mesh Ecosystem** involves hubs in different systems (eg: the bathroom vs. the kitchen) and/or from different providers that are able to communicate with each other and with associated Smart Home devices.

 Impacts on Device Suppliers	 Impacts on User Experience
 Barriers to Entry	 Prices
 Hardware Costs	 Functionality
 Developer Costs	 Adoption
 Innovation	 Outage Risk
 Specification Autonomy	



# Case Study: Yonomi Powers Better User Experience

Third party integrators like Yonomi are providing a band-aid solution until suppliers create a mesh ecosystem



Yonomi offers an agnostic platform that allows connected devices and services to communicate and work together.

## Products

- **Yonomi App:** Allows users to create automated routines for all Smart Home devices
- **Yonomi One:** Allows businesses to design apps and services that integrate with the Smart Home ecosystem
- **Yonomi ThinCloud:** A turnkey Backend as a Service allowing providers to build and scale Smart Home devices.




## The Yonomi Ecosystem



## Benefits to Suppliers:

-  Lower cloud costs
-  Faster time to market
-  Scalable device network
-  Increased innovation
-  Increased adoption
-  Better User Experience

## Benefits to Consumers:

-  Lower service prices
-  Single control point
-  Improved functionality

## Takeaways

- Third-party aggregators can help providers deliver on the promise of a streamlined, connected Smart Home

# Edge Compute Can Improve Reliability and User Experience

Devices that have Edge Capabilities are Able to Service Users Even During Loss of Connectivity



# Case Study: AWS Outage Causes Smart Home Downtime

A major server outage diminished consumer confidence by demonstrating the risks a connected home rooted in over-reliance on cloud compute and processing



In February 2017, AWS's S3 cloud storage service underwent a major outage, leading to malfunction of IFTTT and Smart Home devices that ran on the server.

## Scope of Problem

- Although the most critical downtime due to the AWS outage occurred outside of the home, Smart Home downtime caused a **drop-off in consumer confidence** in these devices
- While AWS typically performs better than many other cloud servers, the outage uncovered the dangers of the existing concentration of dependencies inherent in the dictator model and over-reliance on cloud compute

## Key Takeaways

- **Shift to the Edge:** Now that more critical devices related to security, HVAC, and medical monitoring are being connected, the ability to run offline and at the edge is more important than ever
- **Shift to Mesh Ecosystem:** Although AWS servers offer excellent, top-of-the-line service most of the time, the centralized, winner-take-all model needs to be called into question

## Consumer Experience Challenges:



**Lighting:** Consumers with connected lighting experienced outages for over 3 hours



**Entertainment:** Smart TVs, speakers, and other entertainment devices running on AWS failed to work



**Websites:** Sites that ran on AWS experienced downtime (eg: Slack, Github, the Guardian, etc.), leaving users without access and shrinking revenue for ecommerce sites



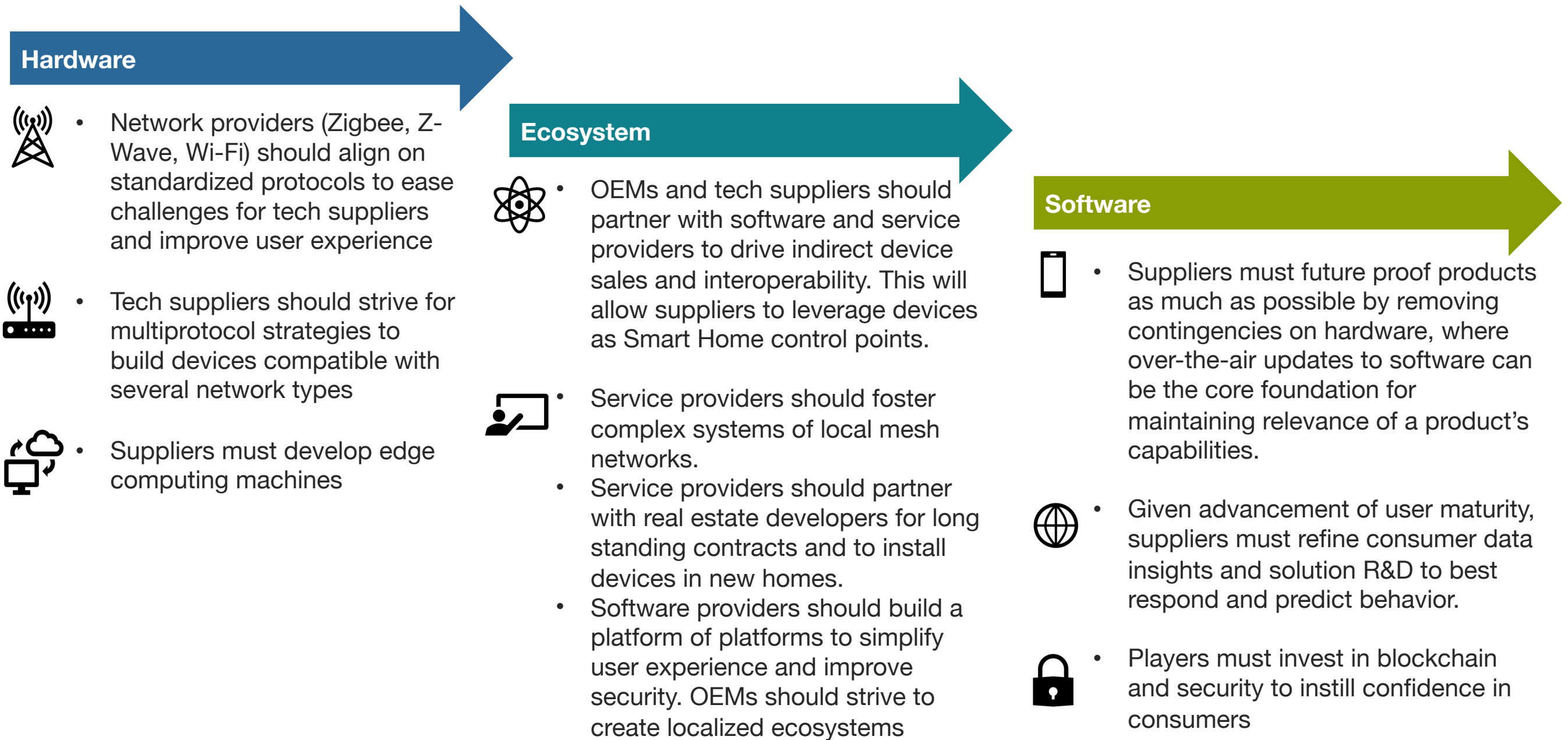
**Thermostat:** Thermostats that ran on AWS stopped working and left consumers in the cold



**Security Locks and Cameras:** Security devices that ran on AWS locked users out of their homes and led to security camera downtime, putting homes in danger

# How to Rescue Crumbling User Experience

Companies should strive to improve the ecosystem, technology, and go-to-market channels to drive optimized user experience and increase overall market potential



# Smart Home Has the Potential to Reach \$73 billion by 2023

If players are able to tackle these hardware, ecosystem and software challenges, they will achieve “Smart Home Victory” and unlock the full opportunity

Total Revenue by Future Scenario, North America (\$ billion)

