



Smart Homes

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Outline

The Internet of Things (IoT)

Definition of Smart Homes


History and evolving of Smart Homes

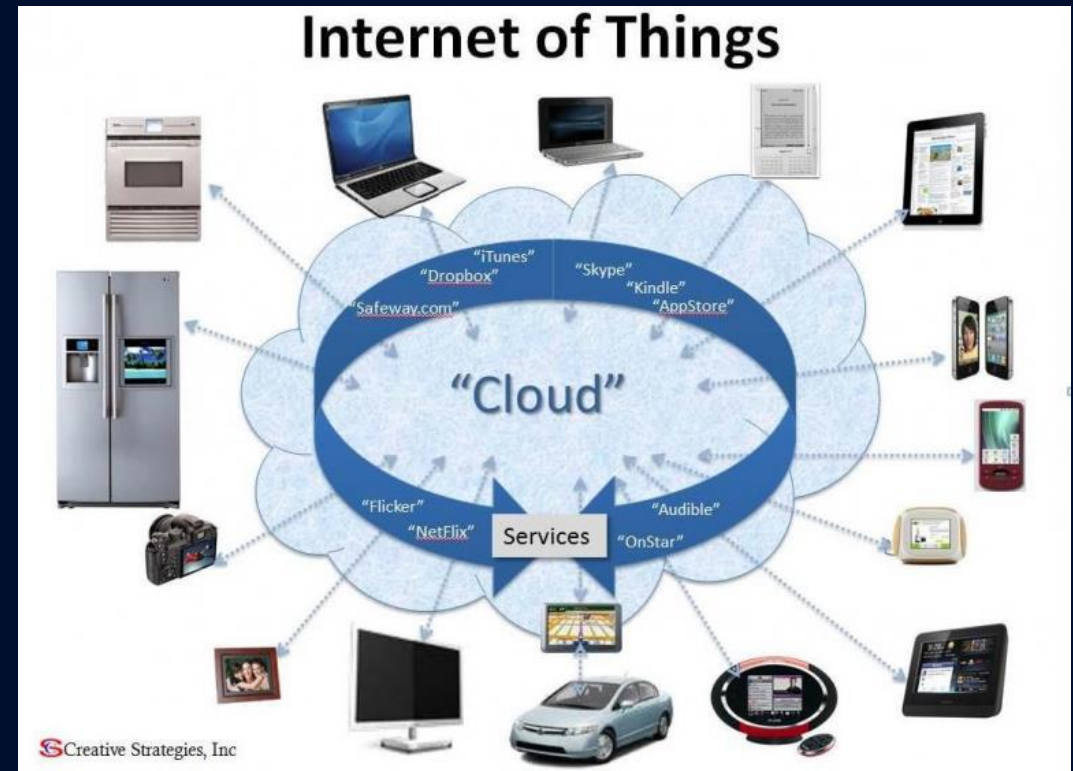
Structure of Smart Homes

Problems and Challenges

- Security
- How to reduce data forgery

The Internet of Things (IoT)

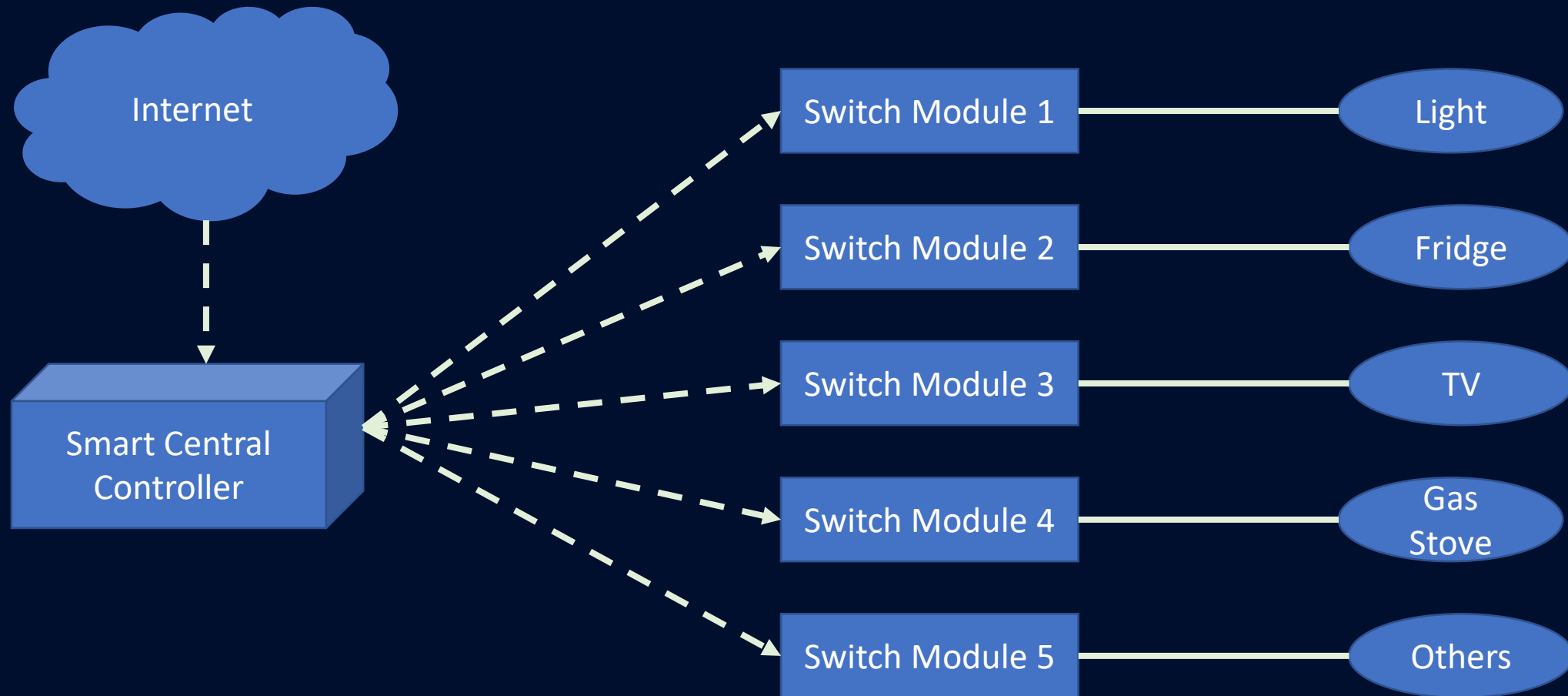
- Definition: things that are connected to the Internet and share data with each other.
 - Things-to-human communication
 - Things-to-things communication
- 
- The diagram, titled "Internet of Things", illustrates a network of connected devices. On the left is a smart oven. In the center and right are two laptops and a smartphone. All these devices are connected to a central blue cloud. Dashed arrows indicate the flow of data between the devices and the cloud, representing both things-to-human and things-to-things communication.



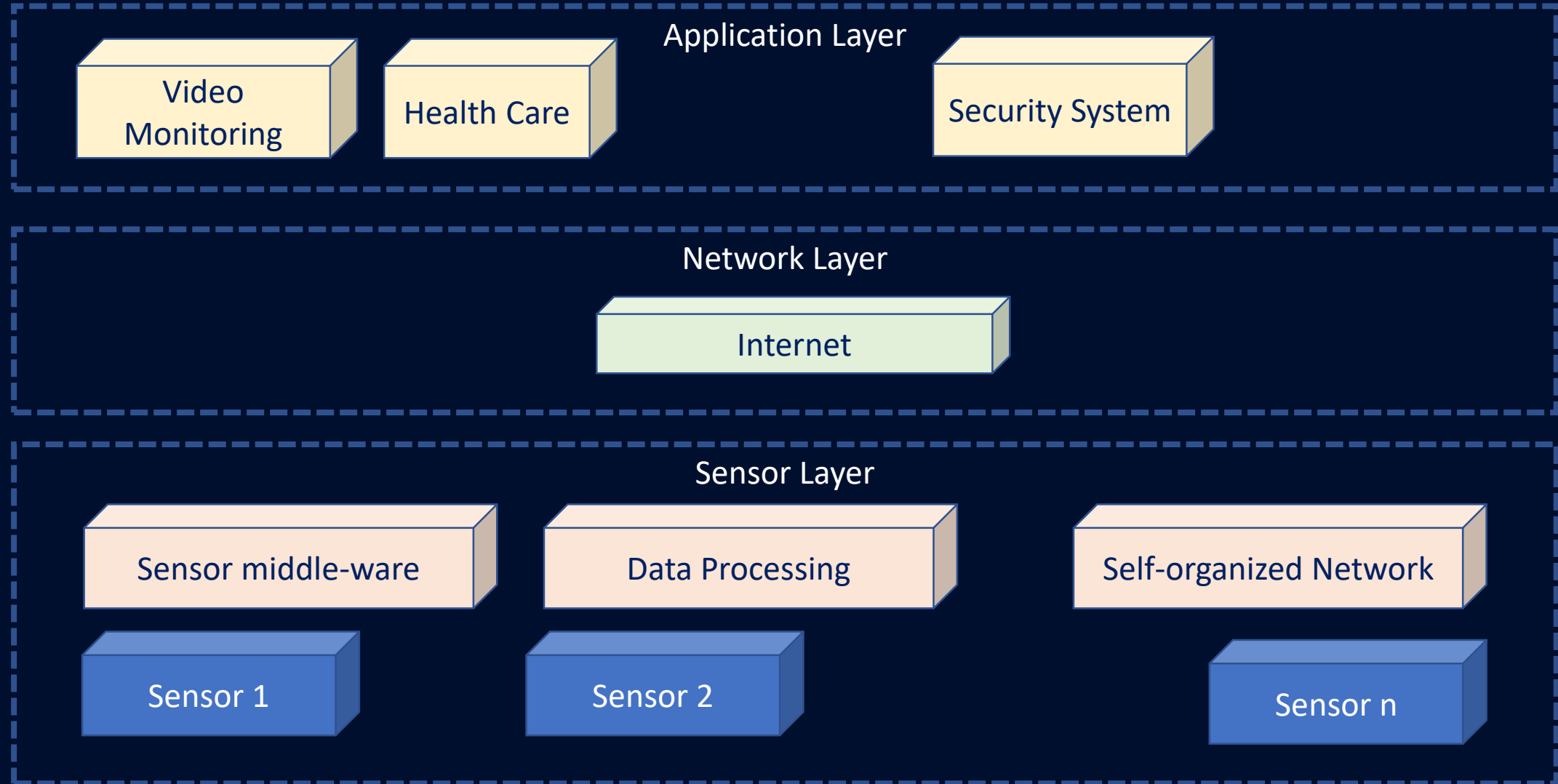
What is a Smart Home? History and Evolving

- A living environment, such as a home, where the household devices and appliances can be controlled automatically or remotely.
- User control and monitor devices and appliances through **Internet**
- Two parts:
 - Part One (Intranet):
 - Devices, appliances
 - Switches
 - Part Two (communicate with the Internet):
 - Interface devices
 - Data controller

Structure of Smart Home



Structure of Smart Home



What can be done to increase security?

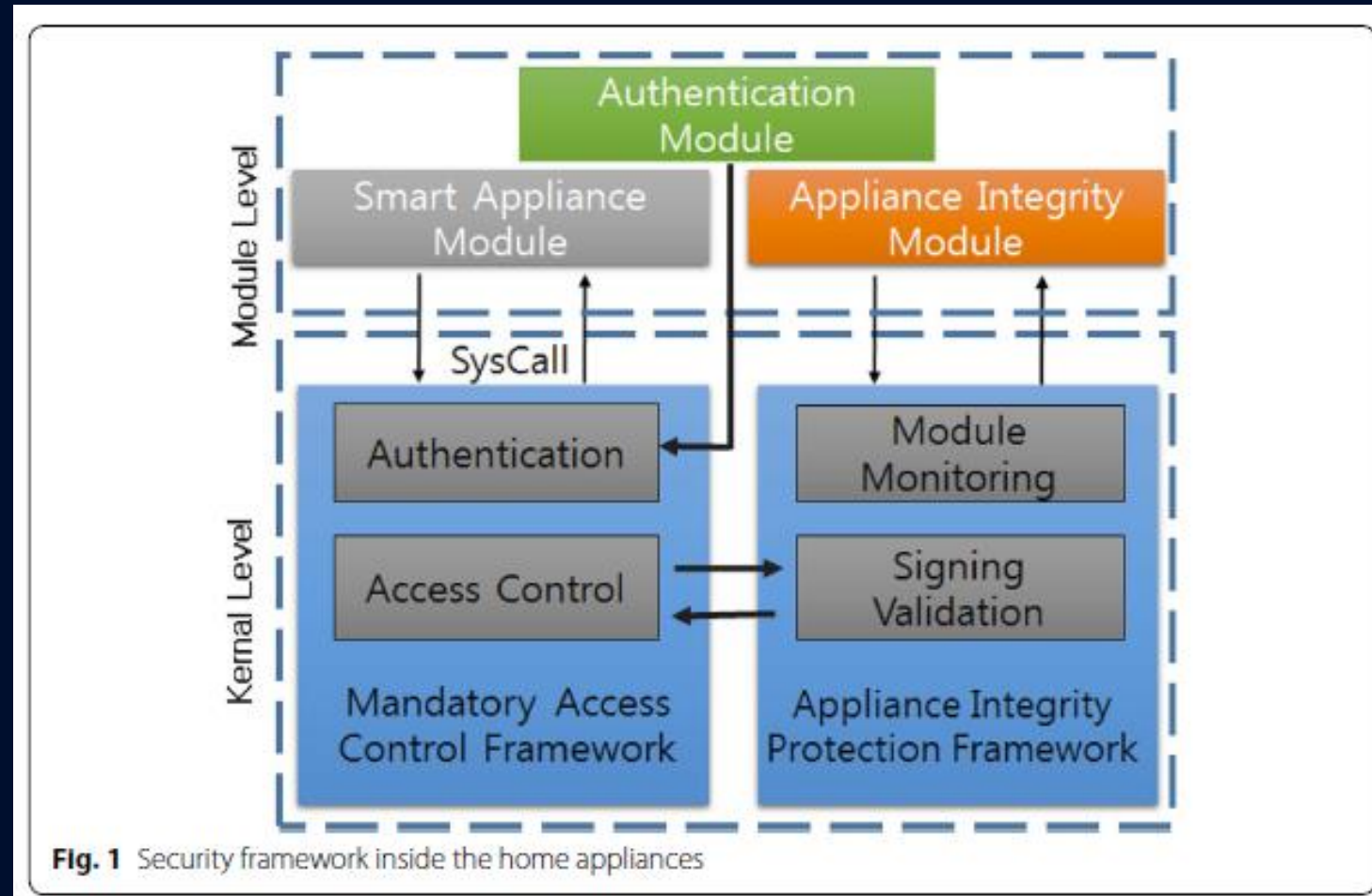
- Module level
 - Authentication module controls the authenticity of applications and devices.
 - Smart appliance module is used to express the unique functions abstractly.
 - Appliance integrity module monitors other newly created or inserted modules and validates integrity

Problems and Challenges

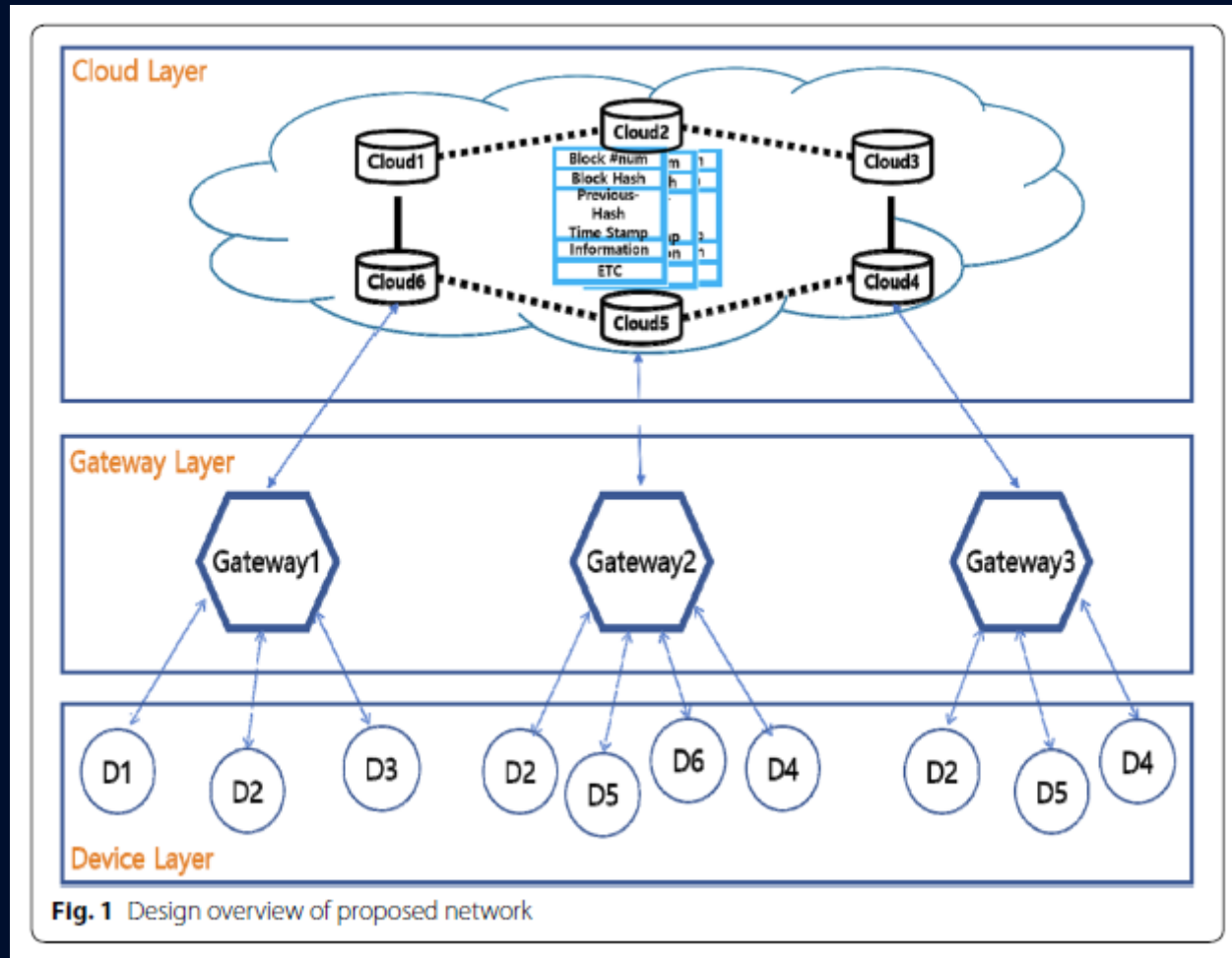
- Requirements for security of the network
 - Integrity
 - The smart device itself needs a security when it has access to the wireless network.
 - Availability/Confidentiality
 - All the devices and appliances send data and information on the Internet.
 - Access to these data should be accessible only by authorized people or devices.
 - Authentication
 - Its configurations prevents an attacker from acting maliciously within a normal network.

What can be done to increase security?

- Architecture

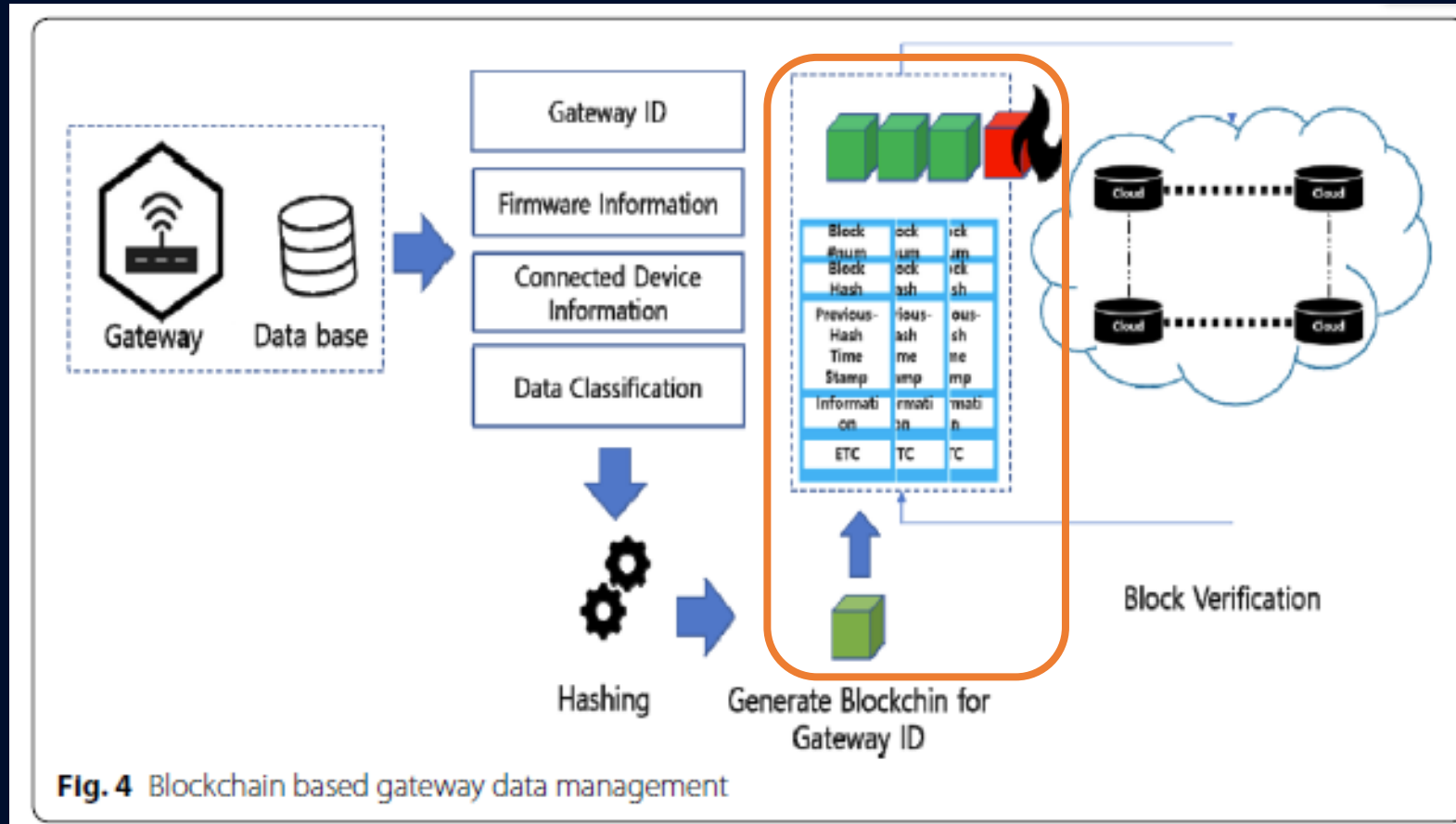


Blockchain-based Gateway Network



Blockchain-based Gateway Network

- Identifying gateway devices and collecting data



References

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- Kang, W. M., Moon, S. Y., Park, J. (2017). An Enhanced security framework for home appliances in smart home. Human-centric Computing and Information Sciences.7-6. doi: 10.1186/s13673-017-0087-4
- Lee, Y., Rathore, S., Park, J. H., Park, J., (2020). A blockchain-based smart home gateway architecture for preventing data forgery, Human-centric Computing and Information Sciences. 10-19. doi: <https://doi.org/10.1186/s13673-020-0214-5>

Questions, please!