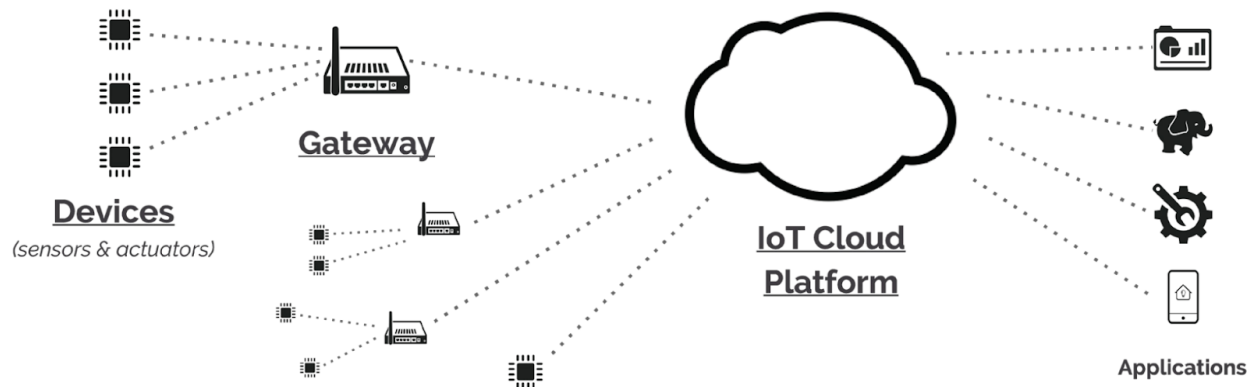


# A simple reference model for connected products

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## Reference model

Based on this simple IoT reference model created by Eclipse.org we define the below terms.



[<https://iot.eclipse.org/white-paper-iot-architectures> p.5, licensed [EPLv1.0](https://www.eclipse.org/legal/epl-v1.0/)]

(Note: we use the term *backend* instead of *IoT cloud platform*.)

## Connected product

The entirety of one or more devices, gateways, backend, apps and the services they represent.

*E.g.*

*Philips Hue, "smart lighting"*

*Kindle, "never be without a book"*

*Good Night Lamp, "share your presence"*

*Alexa, "control your home, using just your voice."*

[Safecast](#), *"crowd-sourced radiation ground truth"*

## Device / ~~Thing~~ / ~~Product~~

A physical device with connectivity, an embedded computer, sensors and actuators.

(Some devices are "product + connectivity", others are rather "service avatars". The term *product* becomes ambiguous given the above definition, so the term *device* is preferred.)

*E.g.*

*Hue lightbulb*

*Kindle e-reader*

*Amazon Echo device*

*Safecast radiation sensor*

## Gateway / Hub / Bridge

A physical device, often bridging physical transports. Might aggregate data, enact local control.

(*Hub* and *bridge* seem to be less commonly used than *field gateway* or just *gateway*.)

*E.g.*

*Hue ZigBee to Ethernet bridge*

*WiFi Internet router (often omitted)*

*Local (field) gateway running NodeRed*

*Smartphone as a BLE to 3G gateway*

*LoRaWAN radio to 3G Internet gateway*

## Backend / Cloud / Platform / Server / API

Devices are connected to backend server(s) "in the cloud", over the Internet, via a gateway.

(*Backend* was proposed by [@clemensv](#) in [this blog post](#). *Cloud* also means Internet. *Platform* could be confused with hardware platform. *Server* is too generic. *API* is imprecise or wrong.)

*E.g.*

*AWS servers hosting Alexa backend*

*Safecast backend to store radiation measurements*

## Client (App / Dashboard / 3rd party service)

Once a device is connected, it allows for virtual interaction, often through a backend API.

(The above terms are not interchangeable. All of them can be seen as backend API *clients*. A backend *has* an *API*, clients talk to it through a *protocol*, using a well defined *data format*.)

*E.g.*

*Hue Web UI*

*AWS Alexa app*

*Safecast radiation map*

*App servers connected to LoRaWAN backend*