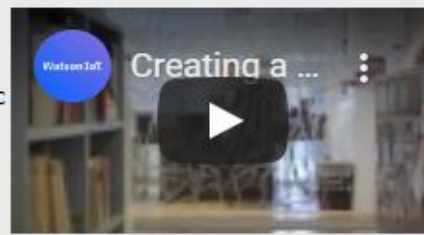


Watch the two videos and answer the following questions :

Smart structures examples



3min21sec
vidéo
(.mp4)



5min34sec

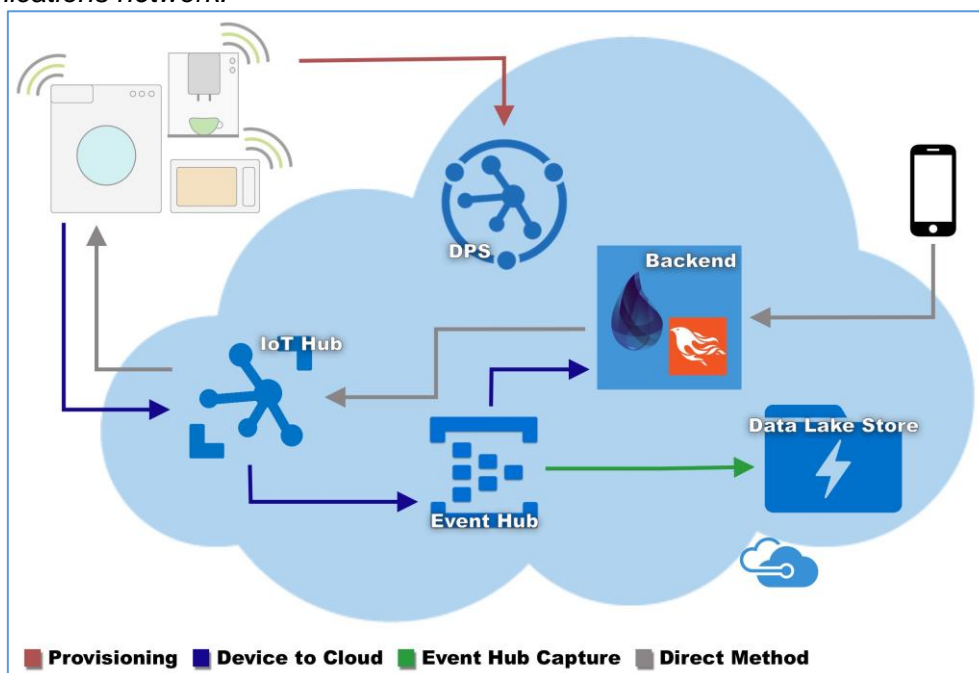
- 1) Smart buildings are buildings with computer systems imbedded in them that support the workers' personal comfort in an environmentally sustainable way. List three kinds of 'smarts' you saw in the videos you were shown.
- 2) **The internet of things** is a term used for a computing system that allows a collection of devices to communicate with each other to support personalized services for human beings. A user does not need to initiate a task: rather, sensors that detect changes influence how small computing devices, not humans, send messages to each other to handle tasks. List three examples of the internet of things you saw in the videos or that you've observed in your daily life:

Devices that engage in the internet of things: There are two kinds of devices that make up the internet of things:

- 3) **Devices with imbedded sensors** contain algorithms (rules) that determine what other devices need to be informed about a function that was 'sensed'. List three examples of devices that sense something then report information to other devices. List three devices with imbedded sensors.
- 4) **Devices that react to detected change** contain algorithms that determine what the device should do based on the detected change. For example, a device connected to a heater will turn it on when it receives a message from a sensing device that contains a thermometer. List three devices that react to a detected change.

- 5) **Sensors monitor natural phenomena** such as heat, light, and motion. Sensors can also be more sophisticated. For example, a camera or video camera can be used by a face-recognition algorithm to determine who has entered a room. List six sensors:

Event driven message passing is a type of algorithm. Rather than have a single controller, the algorithm is made up of a collection of *methods*, each of which can send and receive messages. They can all be part of the software on a single computer, or a collection of computers can use their methods to send messages to other computers via a *communications network*.



The Internet is the network that spans the entire globe allowing humans to communicate with each other, but increasingly it is allowing devices to communicate without human intervention. Methods can *broadcast* information and they can be attuned to *receiving* broadcasts. Methods on devices with sensors monitor the data coming from the sensors, then make decisions based on that data, and broadcast information that other devices receive. Methods that receive that information make their own decisions about how to use that data. Methods on computers connected to mechanical devices can decide to open or lock doors based on the data received, change lighting and temperature, and do a multitude of other functions.

The event model of algorithm design focuses on events (such as a temperature change) that a method reacts to. The method doesn't know what to do with the information, only that it is responsible for sending out the message. Other methods are listening for specific messages that cause them to react and set in motion even more events, some of which are broadcast back, and some of which are used to operate *reactive* devices such as thermostats and light switches.