

VITRUVIUS System Architecture

IOP-IGC08001

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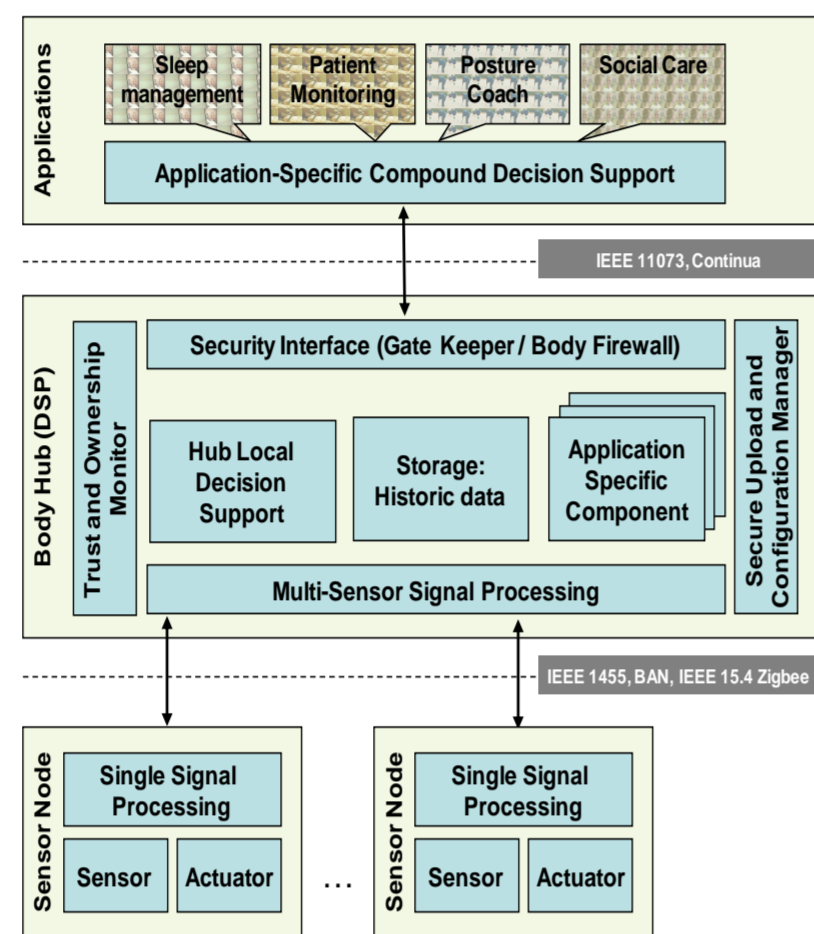
Introduction

The Vitruvius project aims at

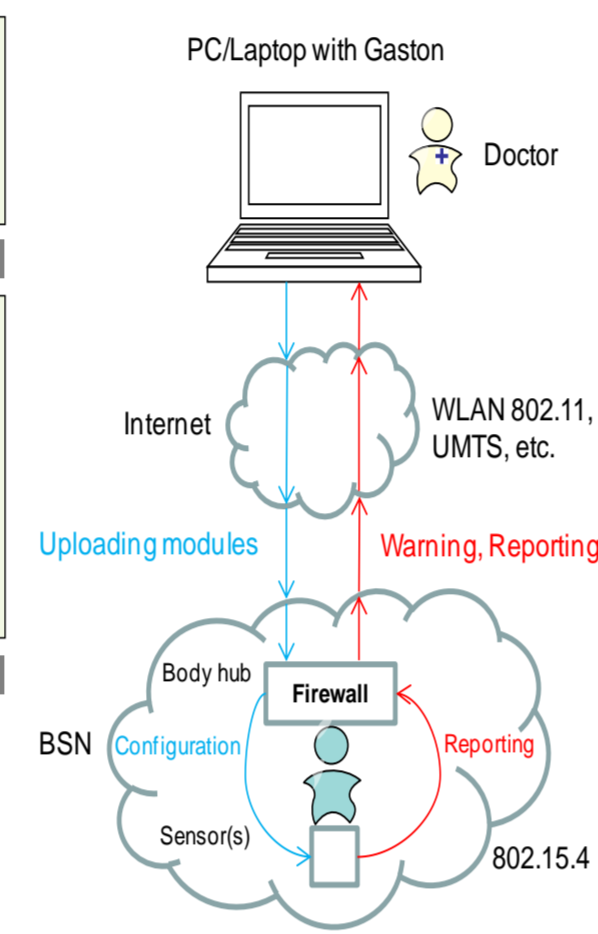
- connecting *human state* to *ambient networks* ...
- ...providing parameters, characterizing personal human state, in a *reliable* and *trustworthy* manner ...
- ...deploying *applications* that are given access to private data

Approach outline

- Distribution of data processing between body hub and sensors
- Body Sensor Network, consists of *sensors* and *body hub*
 - *Body hub* controls sensor operation and serves as a “firewall”
 - *Body hub* is programmed by uploadable *modules* from a Decision Support System (DSS)



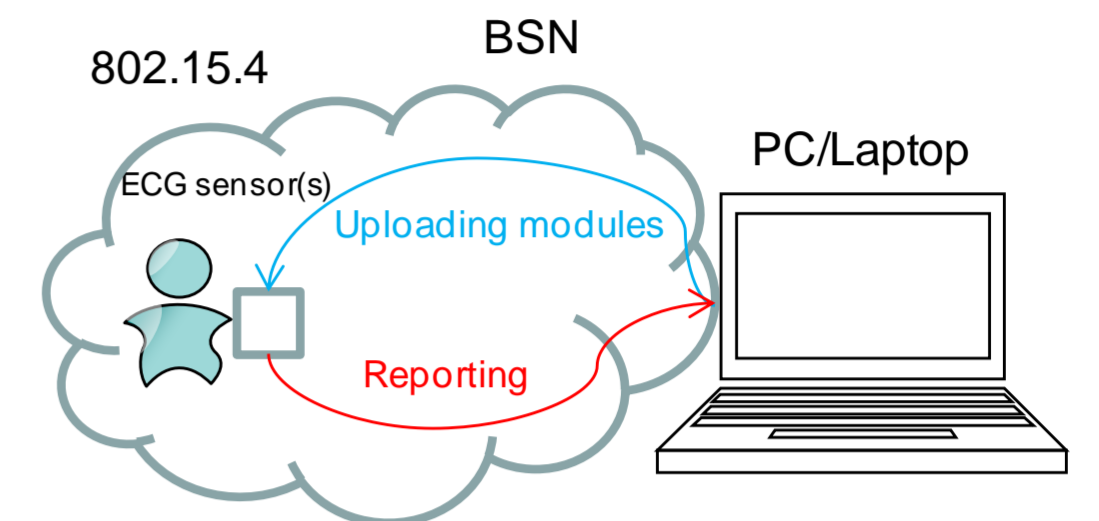
Block diagram of VITRUVIUS architecture



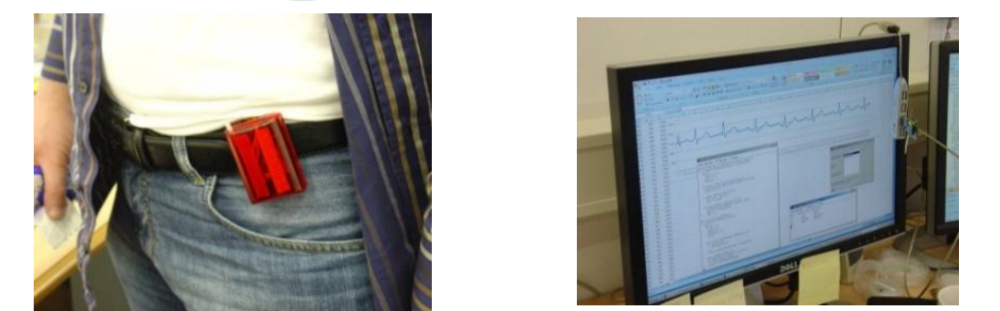
Outline of a health monitoring application. Gaston is a Decision Support System that generates modules for uploading into the body hub.

Current setup

- Back-end PC connected to BSN using 802.15.4 bridge
- PC uploads modules to BSN to sample ECG data



- Two applications
 - processing inside PC
 - local processing inside BSN

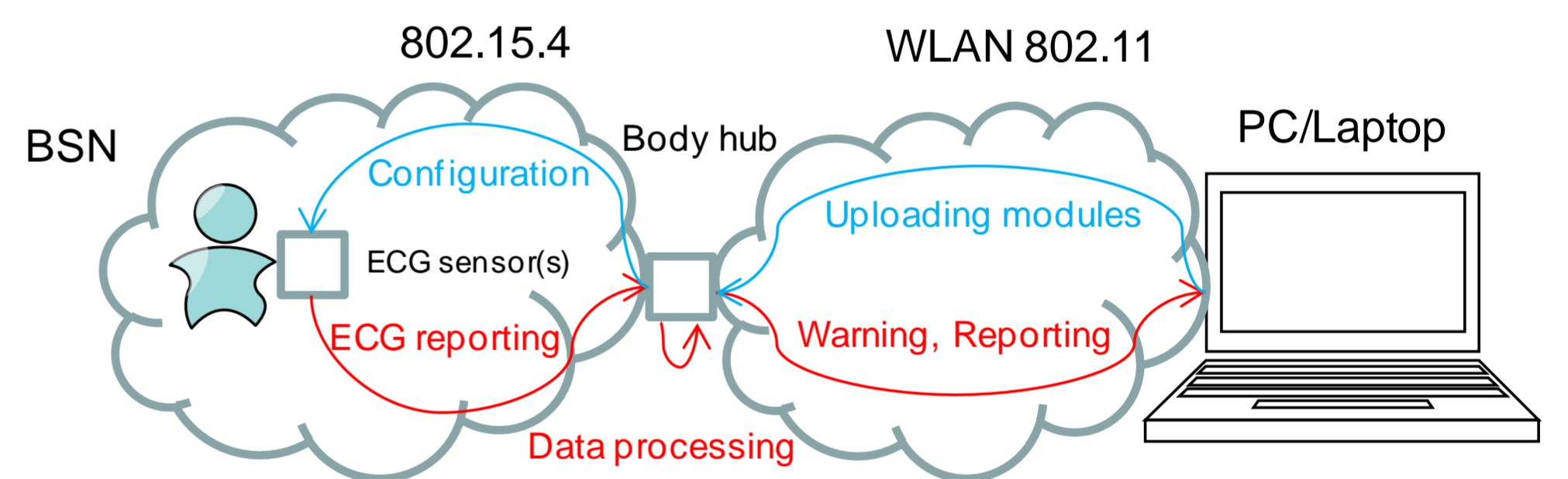


After processing, the sensors send ECG data to DSS for further analysis.

- In progress: fusing with accelerometer sensor

Plans

- Design uploadable module structure containing body hub and BSN instructions
 - program sensors for medical reporting, and body hub to handle this information



After processing, the sensors send ECG data to the body hub for storage and further processing. The body hub reports the final result to DSS for analysis.

Research goal

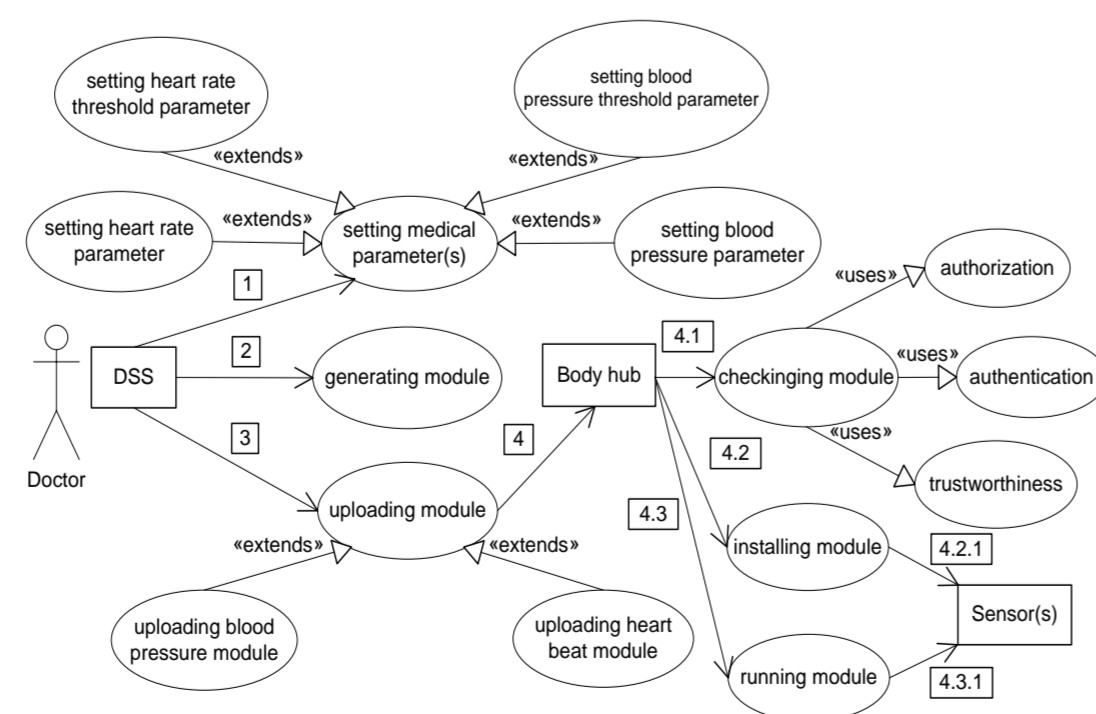
how to maintain trustworthiness and protect privacy

- detail the architecture
- protect communication
 - body hub – DSS form federations of personal networks
 - body hub – sensors form a protected domain
- maintain trustworthiness of
 - body hub under uploads
 - sensors under reconfiguring by body hub
- define access control policies based on *stakeholder roles*
 - patients
 - doctors, clinical personnel
 - application builders

Scenario

Use cases from patient care

- uploading modules from medical DSS (Gaston)
- patient monitoring by doctor
- sensing, processing and storing data



Usecase scenario for uploading modules into the body hub by DSS

- Design the body hub run-time environment
 - according to ITEA TRUST4ALL principles

- Implement the use case
 - uploading this module (with no access control)
 - running it on the hub
 - having the running application
 - storing data on the hub
 - processing sensed data on the hub
 - accessing data on the hub (through expert system)

- Evaluate security and trustworthiness

Website

<http://www.win.tue.nl/san/projects/vitruvius/>

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