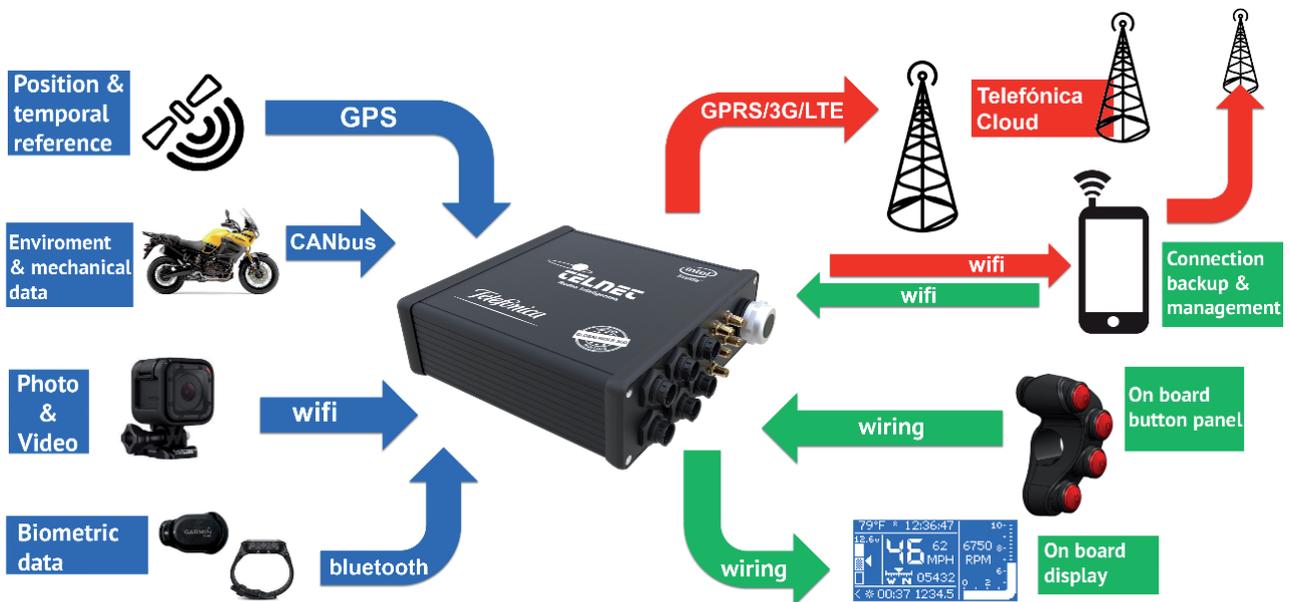# Globalrider

Project origins

Hugo Scagnetti who had overcome a degenerative disease was about to confront an ambitious solidarity project, becoming the Phileas Fogg of nowadays, being the first person traveling all around the world riding a connected motorbike, to raise funds for research of the disease he had managed to overcome.

Features

With Globalrider Project, TELNET faced the challenge of developing in less of 4 month a complex IoT Gateway, prepare it for any unforeseen (humidity, dust, vibrations, hits) that could arise during the journey, and manage all the information gathered for sensors and communications lines. On top, our R&D team had to face all the time taken by the advertising commitments and take care of the whole mechanical integration of the gateway in the Vehicle.

Position & temporal reference	GPS
Enviroment & mechanical data	CANbus
Photo & Video	wifi
Biometric data	bluetooth

GPRS/3G/LTE — Telefónica Cloud

wifi — Connection backup & management

wiring — On board button panel

wiring — On board display

Work flow

Hardware architecture

The Gateway has a SoC (System on Chip) E3845 from Intel Corporation. It is a high end chip from a family of processors based on Atom and intended for the use on mobile devices and IoT equipment. The E3845 has four cores running at 1,91 Ghz. Auxiliary peripherals are also integrated for the Input and output management, memory management and video processing. This chip provides all the necessary processing power needed on any smart thing..
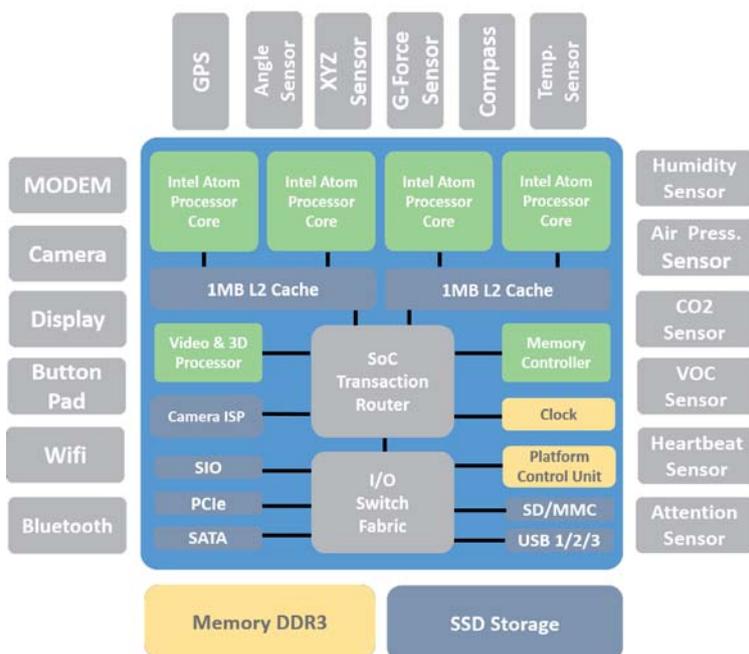

Software architecture

TELNET develops its own Linux distros via Buildroot or Yocto thus ensuring perfect adaptation to customer needs and that all the security breaches that could compromise the project's safety are covered.
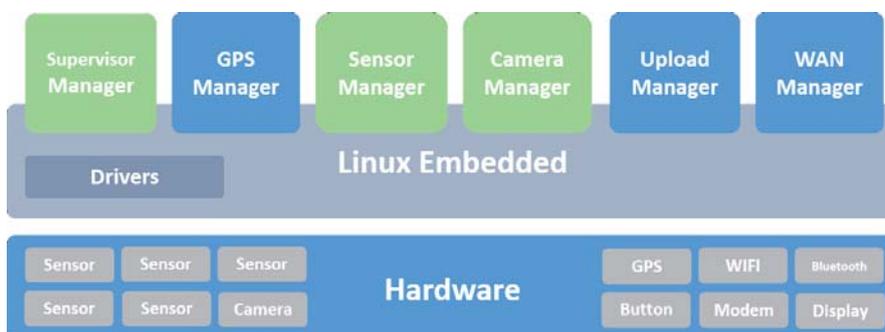
Six managers are executed over the IoT gateway's kernel. These managers run agents specialized in different tasks: from analysing all the data collected from the sensors, to maintaining driver connectivity or interacting with the gateway. This Supervisor Manager is responsible of managing the other managers; interaction with the Gateway is possible through him. This manager has competency over the display and buttons on board representing the most comfortable and safest way to interact with the Gateway while riding the bike. It also offers a web interface which eases advanced configuration from a mobile or a tablet. Likewise, this Supervision Manager is a remote gateway entrance to the whole system.

GPS Manager has the responsibility over the connection of knowing the position of the vehicle at any time. This manager delivers to the other managers (Supervisor, Sensor and Camera) an UTC (Universal Time Coordinate) time stamp with longitude, latitude and altitude coordinates. This information will be the temporal and spatial reference which will be attached to the data collected by sensors. All the data collected by the sensors will be processed by the Sensor Manager. Within this manager we can identify an agent specialized on every single sensor (bio, enviromental, gyroscope, accelerometer,etc) In addition of the data reported by the sensors, it'll be this manager responsibility calculate the speed of the bike by using the GPS position. Over all the collected or calculated data, Sensor Manager will stamp a time and position mark to locate every sample.   Another manager's responsibility is related with the real time analysis from the collected data. As we said previously, the Globalrider IoT gateway owns a policy engine which allows identifying a pattern and trigger an alarm before an accident or any other event happens. Finally, Sensor Manager is responsible to pack all the collected data in a CSV (comma-separated values) file to send it later.

Functional elements
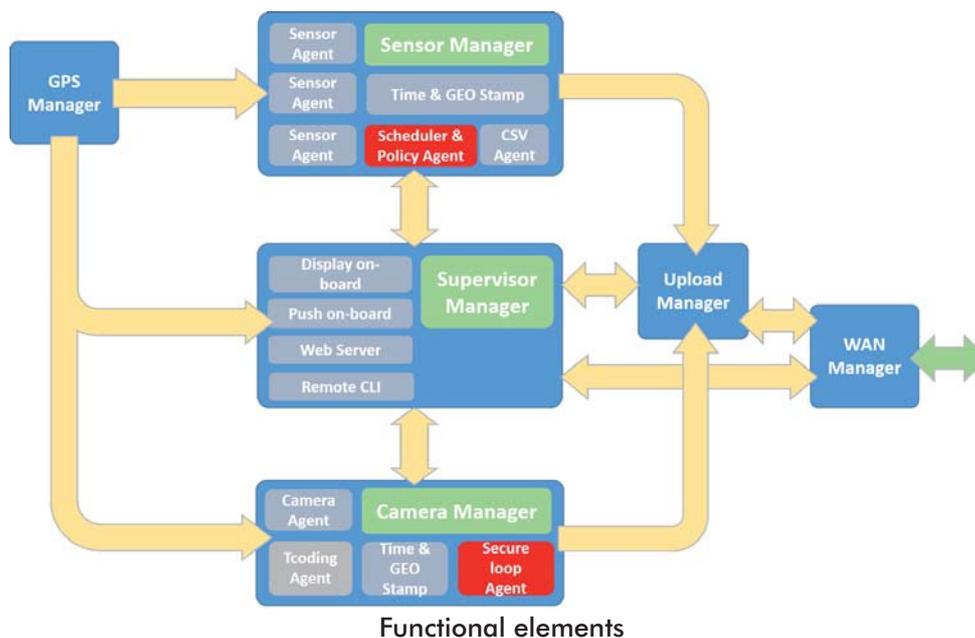
The need of producing and manage content collected by the camera forced us to develop a specific manager for the camera management and processing the videos and photos: Camera Manager. At first instance this manager, through the Camera Agent it is responsible of the remote control of the camera. Hereafter time and position mark from the GPS Manager is applied to the content. Later, the Transcoding Agent allows recoding and compressing the multimedia content adapting, it to the available bandwidth. At last, within the Camera Manager, a manager called Secure Loop is enabled. Then this manager runs in loop mode capturing small video fragments and sending them to the Telefonica's Cloud services. Upload Manager is a temporal repository where the CSV files generated by the Sensor Manager and the multimedia content generated by the Camera Manager are stored. In addition to the storage management, the Upload Manager is also responsible of sending all the data through a secure connection meaning that it is able to detect transfer errors, manage retries, partial sendings and encryption. Likewise Upload Manager is able to prioritize shipments and video security alerts. Lastly through WAN Manager the IoT Gateway connectivity is managed. This manager has competency over Telefonica's M2M global connectivity being able to connect through any technology and mobile service. In addition this WAN connection manager is able to stablish backup connections through WiFi.

Contact us

TELNET Redes Inteligentes
Oficinas Centrales
Polígono Industrial Centrovía
c/ Buenos Aires, 18
50198 La Muela, Zaragoza - España
Phone: (+34) 976 141 800
Fax: (+34) 976 141 810
telnet@telnet-ri.es

Oficina Comercial en Madrid
Avda. Menéndez Pelayo, 85 - 1° A
28007 Madrid - España
Phone: (+34) 91 434 39 92
Fax: (+34) 91 434 40 84

Filial en Portugal
NETIBERTEL
Av. Fontes Pereira de Melo, 35 – 14ºD
1050-118 Lisboa - Portugal
comercial.pt@telnet-ri.es