Validation of Future Internet Technologies for Added Value Precision Agriculture Solutions based on Satellite Imagery

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The agro-food sector presents one of the largest manufacturing industries in Europe; food and drink industry generated an annual turnover of €956Bbn in 2010. The field is considered a key element in the European Research Map. Nevertheless, the agro-food sector presents critical challenges to be overcome. Agricultural producers are extremely disperse and due to the European diversity, farms and crops are subdue to local conditions and languages. New information and communication technologies appeared in the field providing information to help the agricultural producers cultivate with efficiency. However, the demand of services in the field is increasing and it becomes difficult to access to all the users in a locally and specific fashion. This is the case of applications and services oriented to precision agriculture, where massive aerial images have to be processed to extract quantitative information on the quality of the crops in a growing and demanding sector.

The AGROFIRE experiment consists of testing in a cloud computing infrastructure, real-time and on-demand processing of open data satellite imagery provided by Copernicus and Landsat Programmes to create added value Vegetation Index maps for the agricultural sector. The processing is based on the extraction of vegetation indexes and the analysis of the soil moisture through SAR images. These maps provide information about the health of the crops and status of the soil, allowing the farmers to apply the correct actions and practices over each spot of their cultivated areas. The processed images are on demand distributed through an Internet web service.

AGROFIRE is part of the Fed4FIRE FP7 project for Future Internet Research and Experimentation and makes use of its federated European testbeds: Virtual Wall to initially locate the images, which are transferred to BonFIRE for on demand processing and distribution to PlanetLab Europe nodes.