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ITEA 3 is a EUREKA strategic ICT cluster programme

Exploitable Results by Third Parties

FUSE-IT (13023)

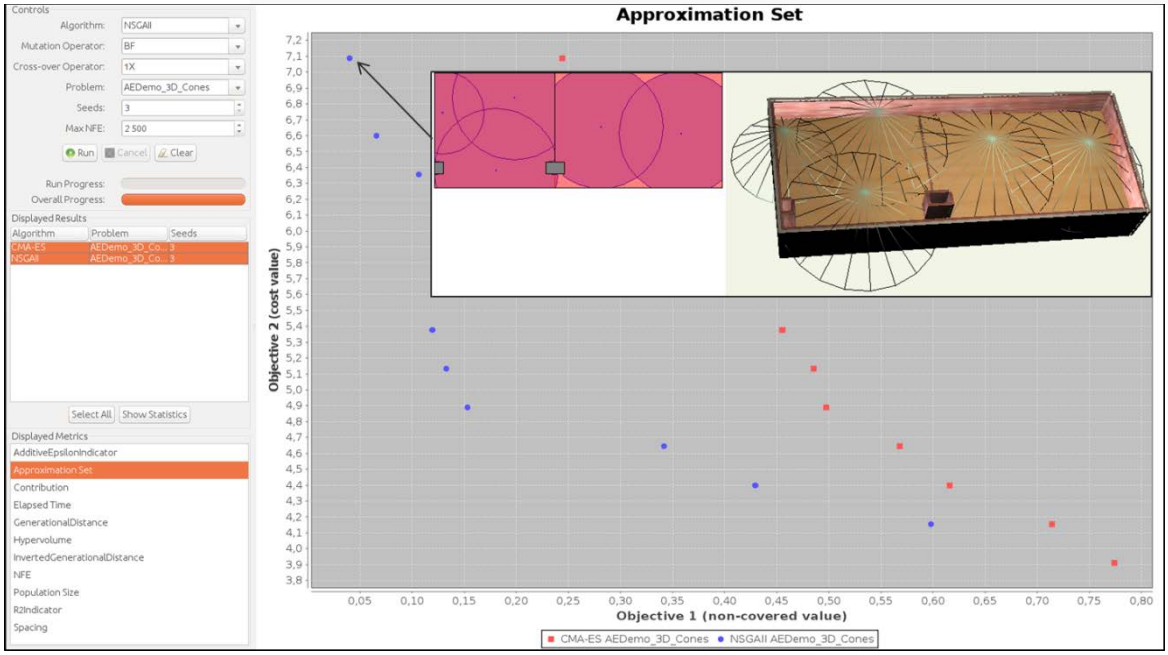
Project details

Project leader:	Adrien Bécue (Cassidian Cybersecurity SAS)
Email:	adrien.becue@airbus.com
Website:	http://www.itea2-fuse-it.com/

Name: Sensor placement optimization software		
Input(s):	Main feature(s)	Output(s):
▪ Optimization problems ▪ Sensor characteristics	▪ Multi-criteria problem solving for optimal placement of sensors in open and confined areas	▪ Optimal sensor placement in building 3D model

Unique Selling Proposition(s):	▪ Drastically simplifies sensor deployment planning, optimization and reconfiguration ▪ Enable agile management of sensor networks for temporary events and office reconfiguration
Integration constraint(s):	▪ Specific input format (json) to describe rooms and specific output format to describe sensor placement.
Intended user(s):	▪ Event organizers, facility managers, building managers
Provider:	▪ Thales Research & Technology
Contact point:	▪ Florence Aligne (florence.aligne@thalesgroup.com)
Condition(s) for reuse:	▪ Subject to commercial license rights.

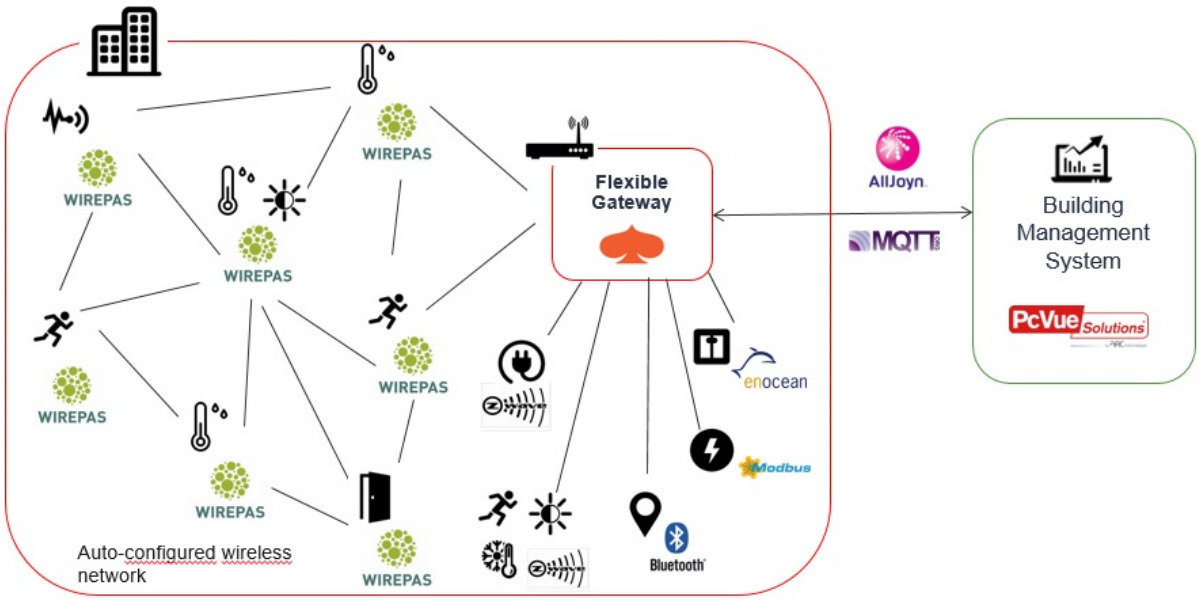
Latest update: 11/12/17



Name: Smart sensor network		
Input(s):	Main feature(s)	Output(s):
▪ Environmental conditions ▪ Presence & motion ▪ Physical content ▪ Energy network	▪ Multiple sensing: temperature, humidity, luminosity, switch, presence, door/window opening, electrical consumption, time of flight sensing ▪ Multi-protocol IoT gateway (10+ protocols supported) and AllJoyn / MQTT output	▪ Sensor values sent on a parametered frequency ▪ Multi-protocol communication & interoperability

Unique Selling Proposition(s):	▪ Multiple-sensing: simplify deployment (wireless sensors), reduce equipment, maintenance and energy costs ▪ Fast sensors reconfiguration and cross-domain exploitation
Integration constraint(s):	▪ AllJoyn or MQTT for communication to building management interface ▪ 10 meters limit distance between 2 sensors in mesh networks ▪ 20 limit number of sensors on per gatewayin mesh networks
Intended user(s):	▪ Building manager, security manager, energy manager, facility manager, utility / infrastructure operator, real estate, construction company.
Provider:	▪ SOGETI HIGH TECH
Contact point:	▪ Lise Pavard (lise.pavard@sogeti.com)
Condition(s) for reuse:	▪ Subject to license rights : monthly costs per device for renting material and software licensing

Latest update: 11/12/17



Name: Lightweight end-to-end encryption mechanism for IoT devices		
Input(s):	Main feature(s)	Output(s):
▪ Smart sensors (with self-enrolment functionality) ▪ IoT Gateway	▪ Authentication via multi HW identifier fingerprint (lowest level of Chip HW components) ▪ End to end encryption via firmware of smart devices and Server (IoT platform)	▪ Data integrity assurance ▪ Sensor authenticity assurance ▪ Data confidentiality assurance

Unique Selling Proposition(s):	▪ All in super slim SW format that does not burden device computing power or operation ▪ Easy enrolement, revocation and update of devices through the manager component ▪ Automatic analysis of new application pattern and protection by configuration of the authorisation layer on server side (Proxy) ▪ Scalable (stateless solution allows proxies to be scaled out to support number of new devices)
Integration constraint(s):	▪ Delivered as SW package including a Proxy which decrypts, checks integrity and forwards data to allowed Apps and a Manager SW by which further identification requirements can be applied ▪ Compatible with legacy user authentication methods
Intended user(s):	▪ IoT network managers / service providers
Provider:	▪ Cassidian Cybersecurity SAS
Contact point:	▪ Paul-Emmanuel Brun (paul-emmanuel.brun@airbus.com)
Condition(s) for reuse:	▪ Proprietary & patented by Airbus Defence & Space

Latest update: 11/12/17

Name: DDoS detection mechanism for smart sensor networks		
Input(s):	Main feature(s)	Output(s):
▪ Smart sensors network (meshed network)	▪ Detection of DDoS (Distributed Denial of Service) attacks on smart sensor networks	▪ Security Alert ▪ Network reconfiguration (node isolation)

Unique Selling Proposition(s):	▪ Applicable to security of smart grids ▪ Low power requirements ▪ Minimal impact on performance & latency
Integration constraint(s):	▪ Requires integration in sensors from third-party vendors ▪ The sensor network organized in clusters
Intended user(s):	▪ DSO (Energy Distribution System Operator), Micro-grid operator
Provider:	▪ University of Burgundy
Contact point:	▪ Sidi Mohammed Senouci (sidi-mohammed.senouci@u-bourgogne.fr)
Condition(s) for reuse:	▪ Research prototype available under an open-source (GPL) license.

Latest update: 11/12/17

(a)

(b)

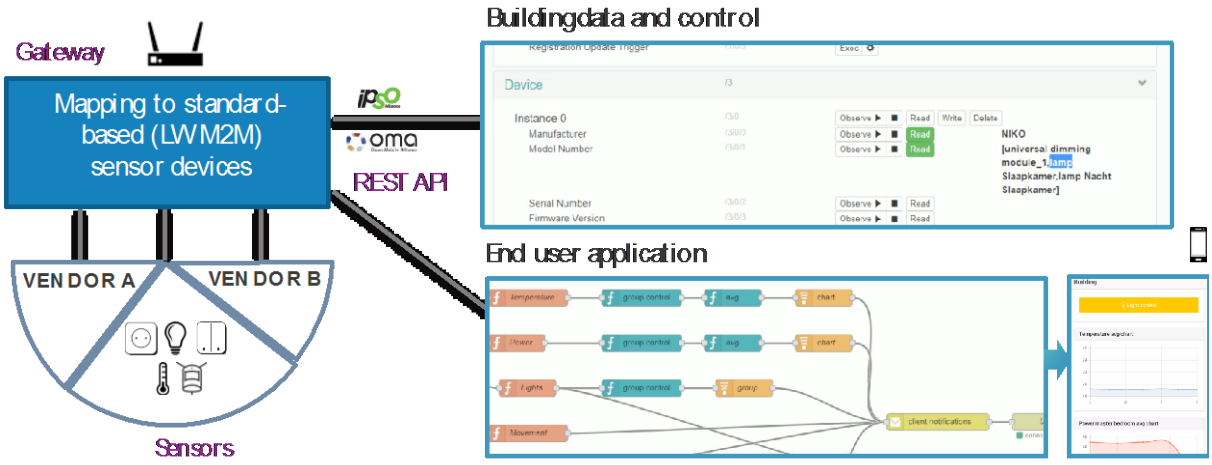
(c)

CH election and intrusion detection test bed: (a) Messages send by the cluster member (red Toggle), (b) CH's election (yellow Toggle), and (c) Intruder detected by the IDS agent (green Toggle).

Name: Gateway with LWM2M REST API and intuitive UI/app		
Input(s):	**Main feature(s)**	**Output(s):**
▪ Niko Sensors ▪ 3rd party sensors	▪ Sensor virtualization to expose heterogeneous sensors as LWM2M compliant devices (REST API interface) ▪ Device discovery ▪ Visual programming of logic and end user UI	▪ Building data and control ▪ End user application

Unique Selling Proposition(s):	▪ LWM2M-based REST API for lower-cost integration in BMS ▪ Faster design of application logic
Integration constraint(s):	▪ Requires Linux platform on gateway ▪ Android-only app
Intended user(s):	▪ Residential / Office building managers
Provider:	▪ imec
Contact point:	▪ Wouter Haerick (wouter.haerick@ugent.be)
Condition(s) for reuse:	▪ License (to be negotiated) on foreground (main features) and background (technology platforms DYAMAND and CoAP++ on top of which features have been developed)

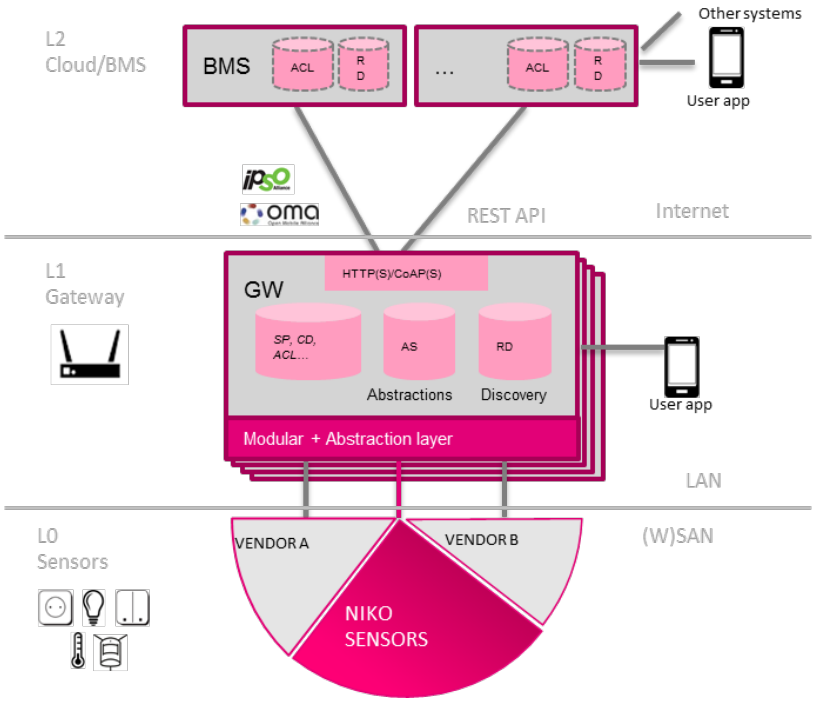
Latest update: 11/12/17



Name: Flexible office management kit		
Input(s):	**Main feature(s)**	**Output(s):**
▪ Niko Sensors ▪ 3rd party sensors	▪ Sensor discovery ▪ Multi-protocol gateway ▪ Home controller ▪ Management HMI	▪ Building data and control

Unique Selling Proposition(s):	▪ Simplified configuration interface (local network) ▪ Device control & read-out parameters via BMS (REST API)
Integration constraint(s):	▪ Specific NHC based wired system components ▪ MQTT for communication to building management interface ▪ Only for certified 3rd party devices
Intended user(s):	▪ Residential / Office building managers
Provider:	▪ Niko
Contact point:	▪ Erik Van Mossevelde (erik.vanmossevelde@niko.eu)
Condition(s) for reuse:	▪ Costs per device and software licensing

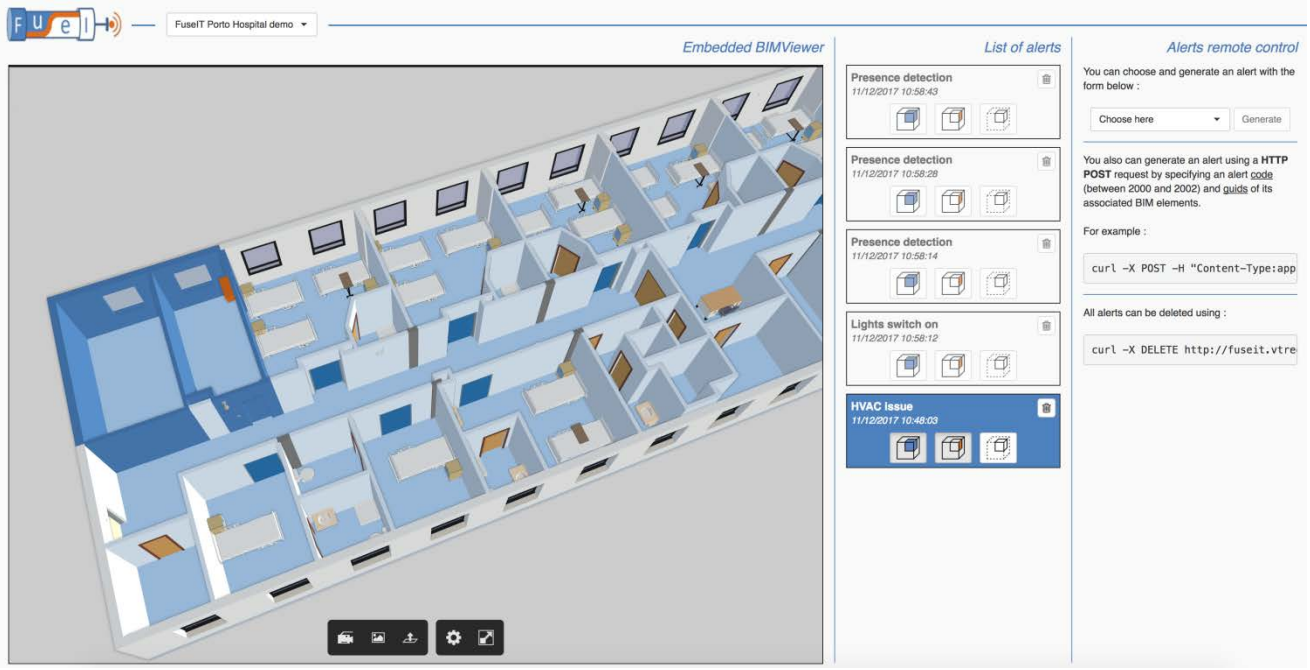
Latest update: 11/12/17



Name: Building Semantic management		
Input(s):	Main feature(s)	Output(s):
▪ BIM building model (architectural model + equipment)	▪ Smart building management interface with semantic rules	▪ BMS dashboards ▪ Alerts management

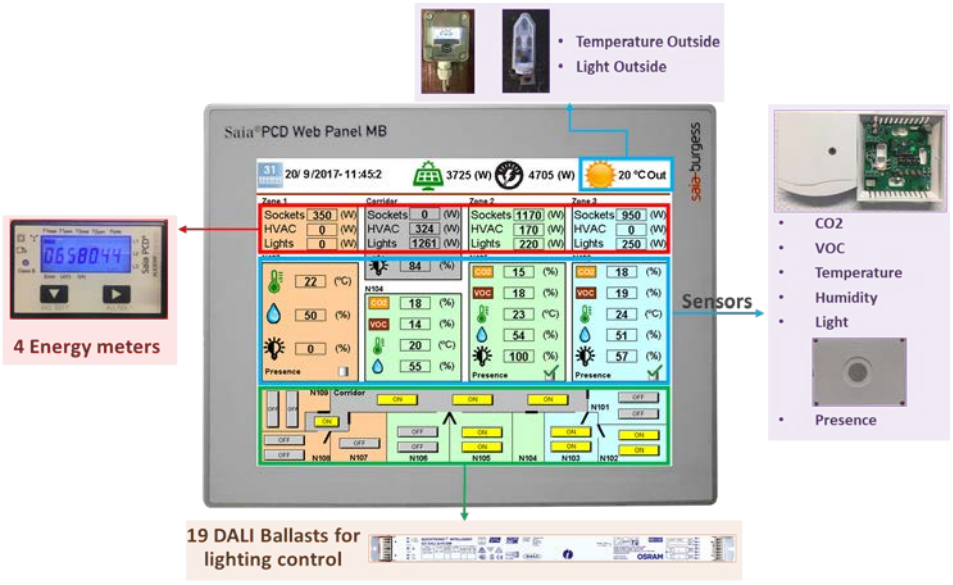
Unique Selling Proposition(s):	▪ Unique insight into the building model thanks to rule-based queries, lightweight 3D interface, semantic exploration, integration capabilities
Integration constraint(s):	▪ RESTful services, SaaS deployment.
Intended user(s):	▪ Building managers, Owners, Facility managers
Provider:	▪ VTREEM
Contact point:	▪ 'Sylvain MARIE (sylvain.marie@vtreem.com)
Condition(s) for reuse:	▪ tbd
	Latest update:

FUSE-IT Building Management Software screenshot

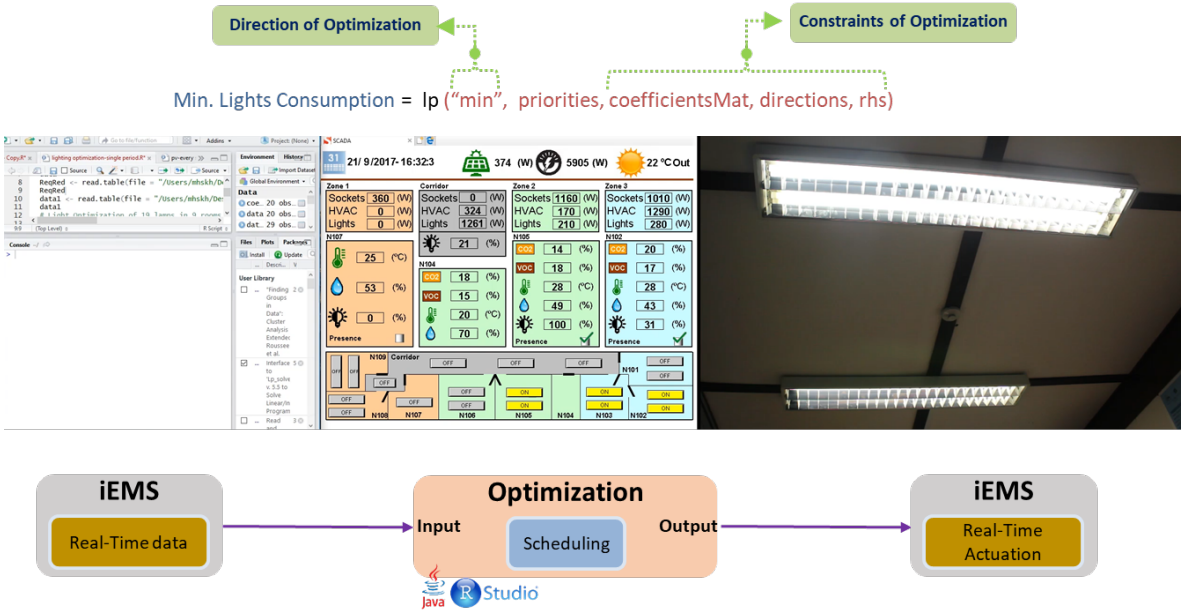


Name: Forecast		
Input(s):	Main feature(s)	Output(s):
▪ Energy resources (consumption and generation) historical data ▪ Market price forecasts	▪ ML prediction algorithms ▪ Strategies for data selection ▪ Context awareness forecasting ▪ Hybrid Methodologies	▪ Day-ahead, hour-ahead and (close to) real-time forecasting
Unique Selling Proposition(s):	▪ Available to multiple entities ▪ Short term forecasting of consumption and renewable generation	
Integration constraint(s):	▪ Available as web service ▪ Requires the specification of all inputs	
Intended user(s):	▪ Support Energy resources management to entities like: building managers, community managers, micro-grid managers, etc.	
Provider:	▪ Polytechnic of Porto – GECAD (Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development)	
Contact point:	▪ Zita Vale – zav@isep.ipp.pt	
Condition(s) for reuse:	▪ Licensing ▪ Authorization by request	
	Latest update: 11/12 2017	

Name: Intelligent Energy Management System (IEMS)		
Input(s):	Main feature(s)	Output(s):
▪ Energy resources forecasts (consumption and generation) ▪ Market price ▪ Demand response programs specifications ▪ Resources prices ▪ Meters and sensors	▪ Building monitoring and control infrastructure ▪ Real-time monitoring ▪ Dynamic profiling ▪ Energy resources optimization ▪ Participation in demand response programs	▪ Scheduled generation/consumption, purchase/sale in the market and external suppliers ▪ Dynamic profiles
Unique Selling Proposition(s):	▪ Dynamic resources optimization using the most recent forecasts ▪ Adaptive and automated demand response ▪ Increased resilience for distributed generation integration in micro-grids and smart grids	
Integration constraint(s):	▪ Available as web service ▪ Requires the specification of all inputs (including the results from the several forecasts) ▪ Complete system requires integration with energy infrastructure and sensors	
Intended user(s):	▪ Aggregators, like Micro-grid operator, Building Managers, Community Managers, etc	
Provider:	▪ Polytechnic of Porto – GECAD (Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development)	
Contact point:	▪ Zita Vale – zav@isep.ipp.pt	
Condition(s) for reuse:	▪ Licensing	
	Latest update: 11/12 2017	



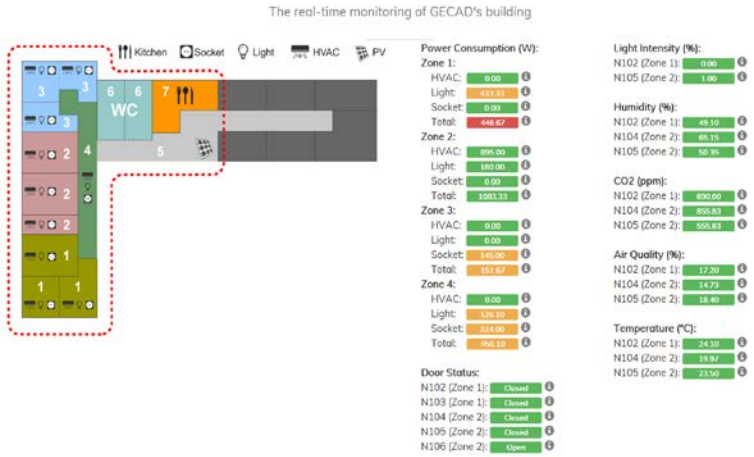
Intelligent Energy Resources Management (iEMS) webpanel



iEMS lighting optimization considering Demand Response (demo)

Name: Intelligent notifications and alerts		
Input(s):	**Main feature(s)**	**Output(s):**
▪ Building model ▪ Building monitoring	▪ Semantic model ▪ Context-based reasoning ▪ Events correlation ▪ Alarms generation	Alerts and alarms notifications

Unique Selling Proposition(s):	▪ Available to multiple entities ▪ Energy and security events correlation ▪ Intelligent reasoning
Integration constraint(s):	▪ Available as a Java library ▪ Requires the building semantic model and respective individuals as input ▪ Requires the SWRL rules as input ▪ Requires the respective assets measurements as input ▪ Outputs a set of alarms identifying the individual, the action to take, a message and an alarm level when it makes sense
Intended user(s):	▪ Building and security Managers.
Provider:	▪ Polytechnic of Porto – GECAD (Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development)
Contact point:	▪ Zita Vale – zav@isep.ipp.pt
Condition(s) for reuse:	▪ Ontology publicly available ▪ Licensing
	Latest update: 11/12 2017

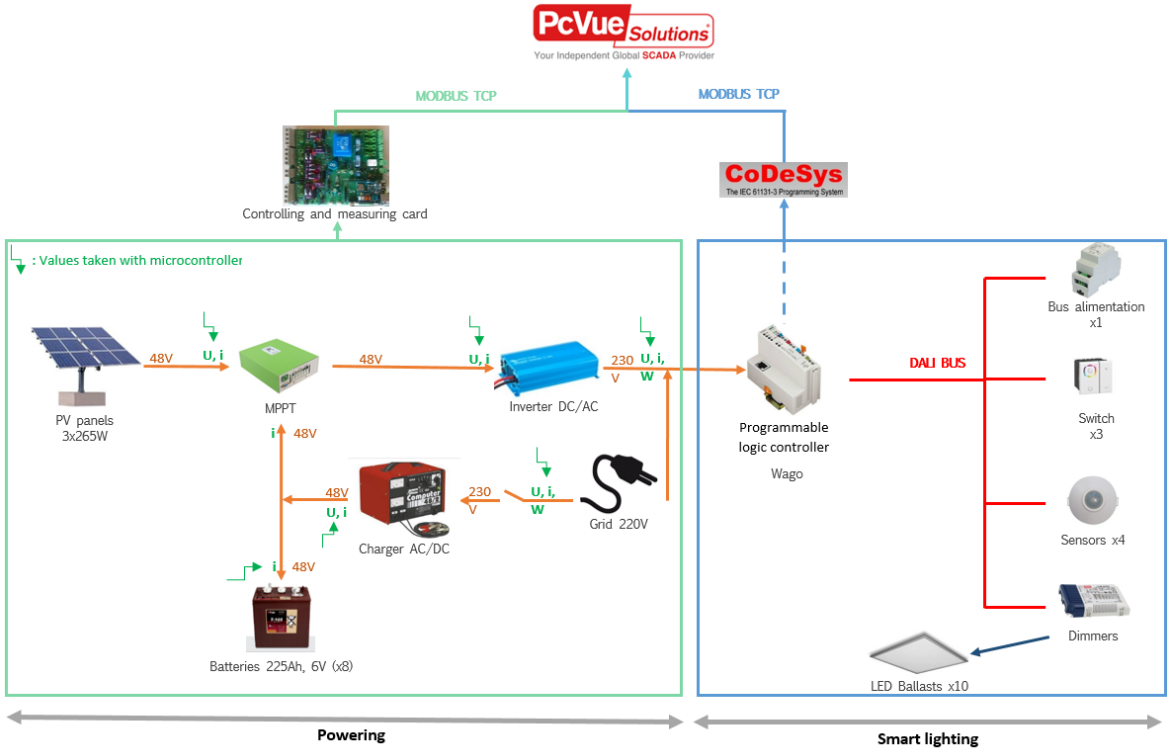


Notifications and alerts implementation in GECAD building

Name: Smart lighting management module		
Input(s):	**Main feature(s)**	**Output(s):**
▪ Lights ▪ Smart plugs ▪ Energy storage ▪ Presence sensors ▪ Luminosity sensors ▪ Power meter ▪ Smart Inverter	▪ Peak shaving ▪ Self-consumption ▪ Instructed load management (MAS) ▪ Power source prioritization	▪ Optimized management of lighting and powering system

Unique Selling Proposition(s):	▪ Reduced energy bill ▪ Reduced environmental impact ▪ Improved building comfort and occupancy management
Integration constraint(s):	▪ Require investment in lighting and powering devices ▪ Instructions from the MAS regarding priorities
Intended user(s):	▪ Facility manager, Building manager, residential, office, industrial, utility or public buildings
Provider:	▪ ICAM
Contact point:	▪ Bruno Gilbert (bruno.gilbert@icam.fr)
Condition(s) for reuse:	▪ Libraries under open source license ▪ Communication protocol free (Modbus)

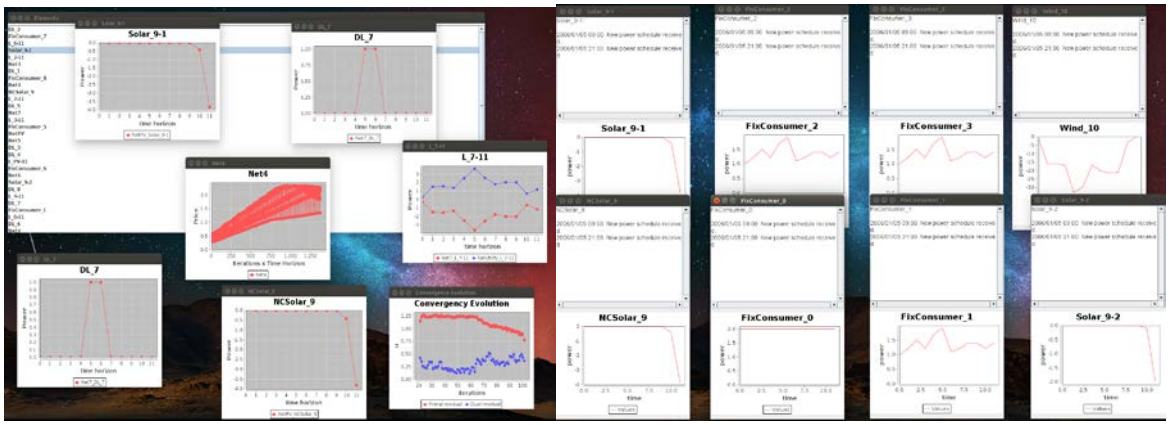
Latest update: 11/12/2017



Name: Multi-Agent System For Microgrid Optimization and Control		
Input(s):	Main feature(s)	Output(s):
▪ Agents (consumers, suppliers, active consumers) ▪ Energy forecasts	▪ Energy grid optimization by mutual transaction among agents ▪ Convergence by iteration towards optimal energy distribution	▪ Smart grid / micro-grid optimization

Unique Selling Proposition(s):	▪ Reduced energy bill ▪ Reduced environmental impact ▪ Improved resilience and stability of power network
Integration constraint(s):	▪ Requires jvm. ▪ Requires internet connection.
Intended user(s):	▪ DSO (Energy Distribution System Operator), Micro-grid operator
Provider:	▪ CEA
Contact point:	▪ Sandra Garcia Rodriguez (Sandra.GARCIARODRIGUEZ@cea.fr)
Condition(s) for reuse:	▪

Latest update: <INSERT LATEST UPDATE DATE HERE>



Name: Building ontology-based information model		
Input(s):	Main feature(s)	Output(s):
▪ Building KPIs ▪ Ontology framework ▪ BIM model	▪ Modeling building systems throughout energy, facility, ICT and security chains	▪ Logic backbone for building & security management
Unique Selling Proposition(s):	▪ Enable quick tailoring of smart building management and security management assets to any kind of building	
Integration constraint(s):	▪ Application-dependent instantiation of the data model describing the building ▪ Application-dependent rule definition for normal and abnormal behaviors in the building ▪ Middleware for multi-source data integration and fusion based on a unified data model for IoT and security functions description.	
Intended user(s):	▪ Building SCADA editors, Security supervision software editors, building automation vendors	
Provider:	▪ University of La Rochelle	
Contact point:	▪ Nouredine Tamani (nouredine.tamani@univ-lr.fr)	
Condition(s) for reuse:	▪ Core Ontology model freely available ▪ Research prototype available under an open-source (GPL) license.	
	Latest update: 08/12/2017	

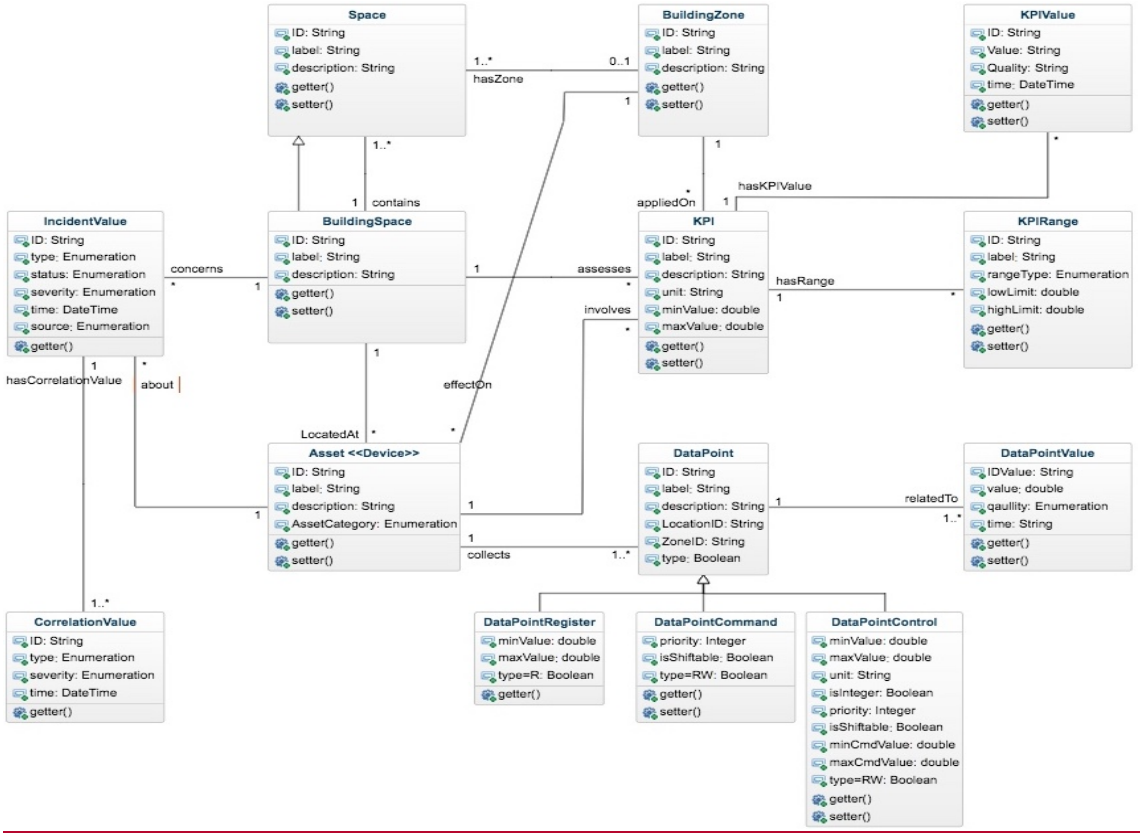


Figure 1. Fuse-IT Core Ontology Data Model.

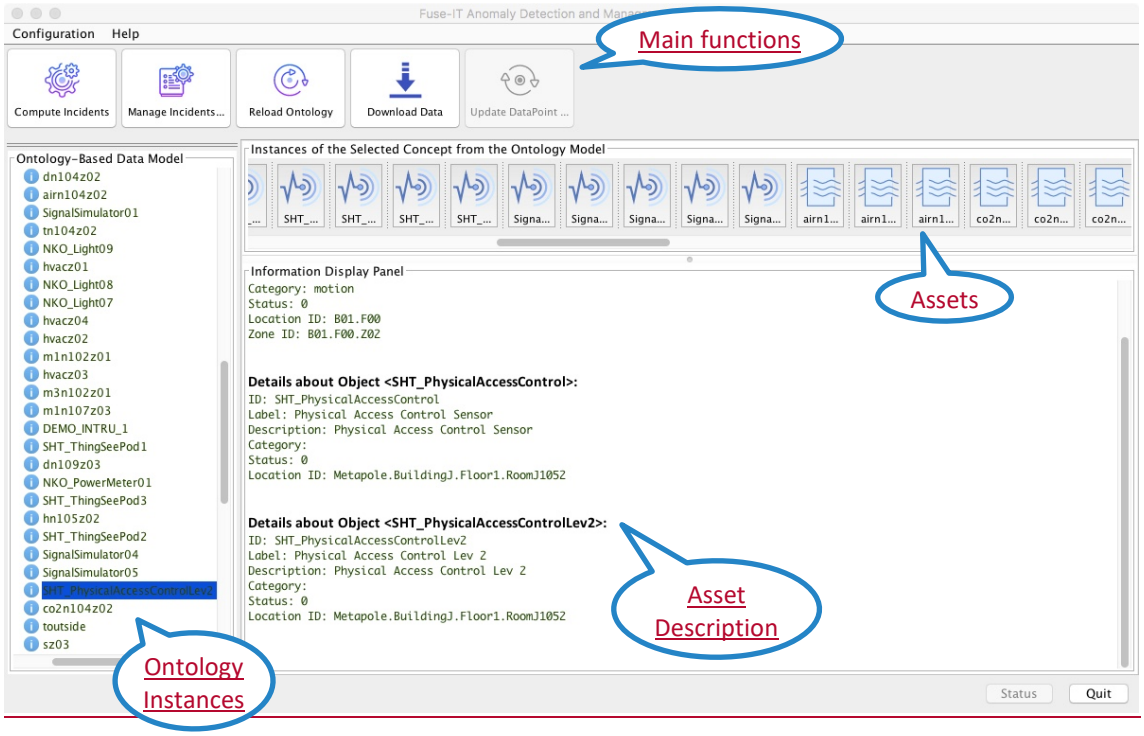


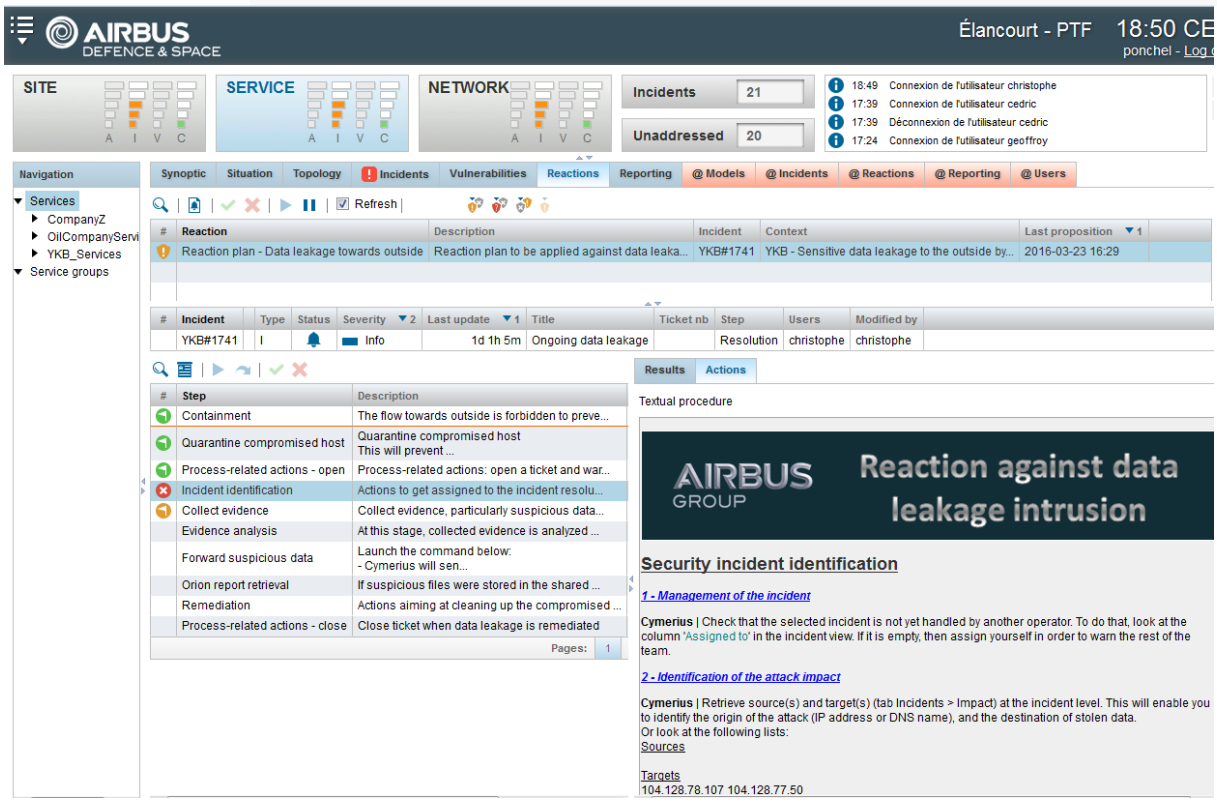
Figure 2. FUSE-IT Ontology-Based Anomaly Detection Main Interface.

Name: Behaviour-based physical intrusion detection		
Input(s):	Main feature(s)	Output(s):
▪ Video-cameras ▪ Badging system ▪ Motion sensor	▪ Facial recognition ▪ Motion analysis ▪ Sensor data fusion	▪ Physical intrusion alert ▪ Physical indoor geo-location alert ▪ Multi-factor authentication access control
Unique Selling Proposition(s):	▪ Insider identification and tracking for critical infrastructures ▪ Enhanced security compared to device-based access-control ▪ Enhanced maintenance and installation due to abstraction layer	
Integration constraint(s):	▪ Delivered as HW+SW package with a unique messaging middleware for robust and seamless installation or maintenance of physical security devices. ▪ Compatible with legacy building physical security installations	
Intended user(s):	▪ Critical infrastructure operators, patrol service providers	
Provider:	▪ Thales Services	
Contact point:	▪ Jean-François Goudou (jean-francois.goudou@thalesgroup.com)	
Condition(s) for reuse:	▪ Proprietary & patented by Thales Services	
	Latest update: 11/12/2017	

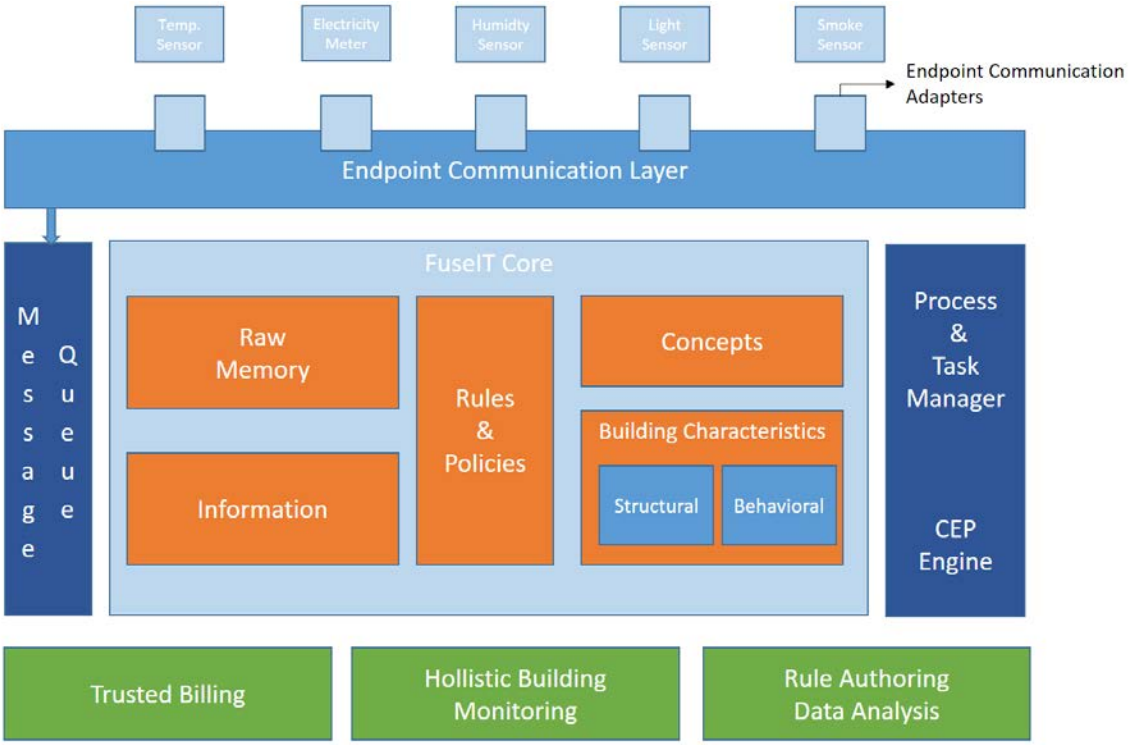
Name: Physical – Logical security alert correlation module		
Input(s):	Main feature(s)	Output(s):
▪ Physical security alert ▪ Cyber-security incident	▪ Rule-based correlation of physical and cyber security alerts ▪	▪ Enriched alerts and response plan ▪

Unique Selling Proposition(s):	▪ Enables real time alerting on combined cyber & physical threats ▪ Enables onsite intervention / investigation in due time ▪ Enables full attack path reconstruction
Integration constraint(s):	▪ Standard SIEM component (QRadar / ▪ Network discovery tool
Intended user(s):	▪ Security officers, Critical infrastructure operators
Provider:	▪ Cassidian Cybersecurity SAS
Contact point:	▪ Christophe Ponchel (christophe.ponchel@airbus.com)
Condition(s) for reuse:	▪ Commercial license

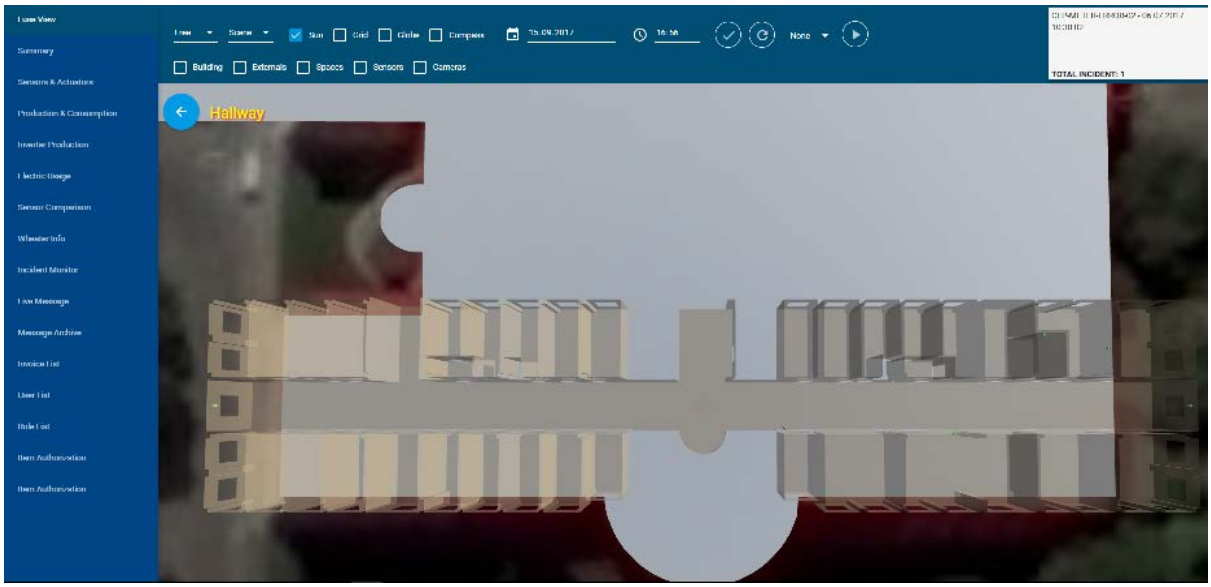
Latest update:



Name: Smart building management interface		
Input(s):	Main feature(s)	Output(s):
▪ Building sensor data ▪ 3Dbulding model	▪ Smart building management interface	▪ Zones characterization ▪ Meta-data
Unique Selling Proposition(s):	▪ Immersive user interface with high graphical fidelity and real time building information displayed	
Integration constraint(s):	▪ Every sensor provider (software or hardware) need to implement adaptors that can send and receive data from/to FUSE-IT BMS	
Intended user(s):	▪ Building managers, Facility Managers ▪ Hospitals, public administration buildings	
Provider:	▪ MOSBIT	
Contact point:	▪ 'Mustafa Kemal Özel (mustafakemal@mosbilisim.com)	
Condition(s) for reuse:	▪ Implementation is proprietary ▪ Architecture model can be freely used	
	Latest update:	



FUSE-IT Building Management Software architecture



FUSE-IT Building Management Software screenshot

Name: Unified view		
Input(s):	Main feature(s)	Output(s):
▪ Smart building management interface ▪ Security Management interface ▪ Ontology-based building Information model	▪ High-level building management KPIs display on real time (including cross-domain KPIs) ▪ Graphical representation of building status and events (energy, facility, ICT, security) ▪ Display of building meta-data	▪ Bulding & energy management dashbords ▪ KPIs and statistics reports

Unique Selling Proposition(s):	▪ Unique scalable and universal solution for integrated building energy, facility, ICT and security supervision.
Integration constraint(s):	▪ Windows 7 or greater (x64 only) ▪ PcVue 12 or greater ▪ IIS
Intended user(s):	▪ Building managers, critical infrastructure operators
Provider:	▪ ARC Informatique
Contact point:	▪ Florent Martin (f.martin@arcinfo.com)
Condition(s) for reuse:	▪ Licensing
	Latest update: