Pilot SHIELD

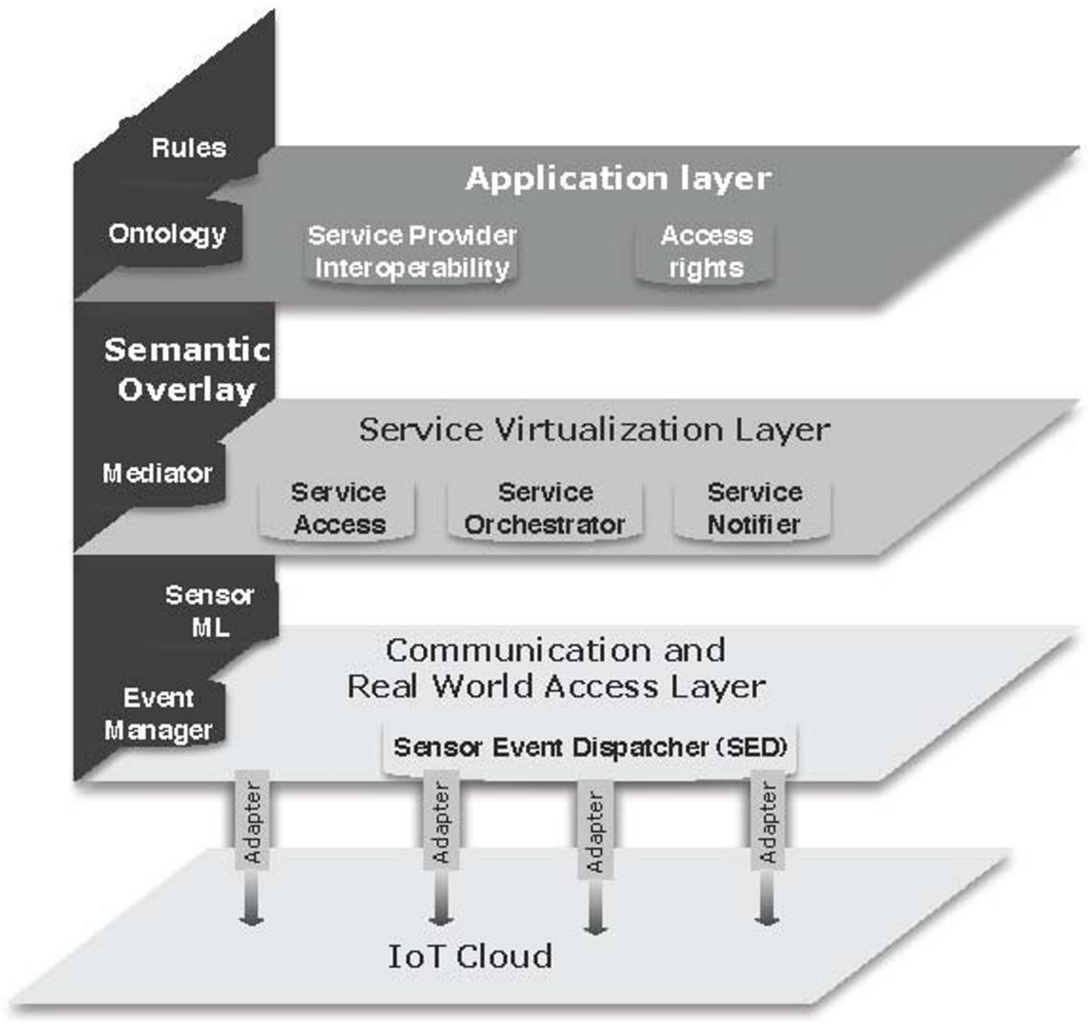
pilot embedded Systems
arcHItecturE for multi-Layer Dependable solutions

Wp6 - Platform Integration, Validation and Demonstration

Task 6.3 - pSHIELD Pilot Demonstrators

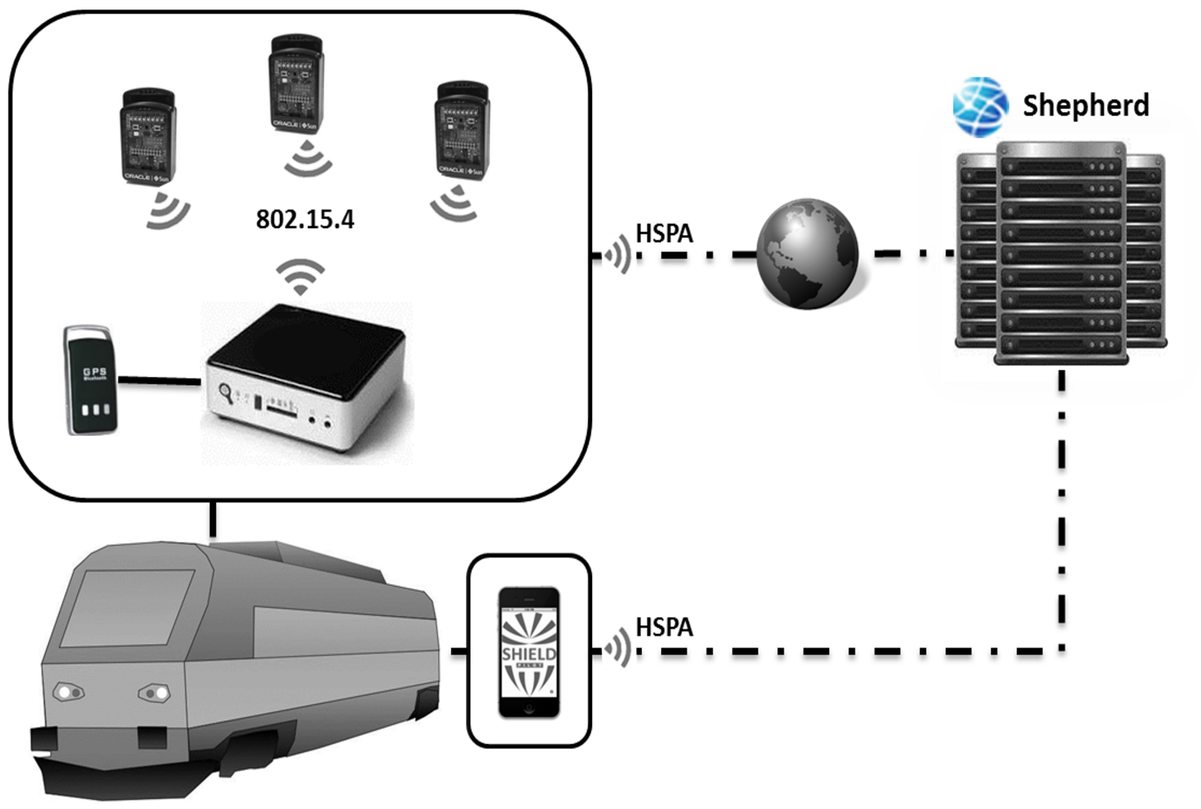
The prototype demonstrates the core pSHIELD SPD functionalities in the context of railway system.

- **Secure handling of critical information of on-train deployed sensors**
- **Continuous monitoring and tracking of trains through measuring of parameter (i.e., temperature, motion, location)**
- **Seamlessly integrating on-train deployed sensors with Telenor Shepherd platform**



Use Case: Interoperable Rail Information System (IRIS)

- Continuously monitoring of trains and railway infrastructure
- Detecting any unusual condition such as high temperature, unexpected positions and unexpected movement
- Transferring such information to different actor (i.e., train operator, rail infrastructure owner, consumer) involved in the rail system



Prototype Implementation Features

- Auto start up on power failure
- Auto reconfigurable on software failure
- Auto synchronization on software failure

} **Dependability**

- End-to-end secure communication
- Mal-user detection

} **Security**

- Access control for accessing sensor data

} **Privacy**

Prototype Test Bed

- **Embedded System:** EPIA Nano-ITX
- **Embedded Processor**: VIA C7
- **Operating System:** Ubuntu Linux
- **Sensor Platform:** Sun SPOT, IQRF

Accessing 0n-Train Sensor Data through Telenor Shepherd

Sun SPOT Sensors Data

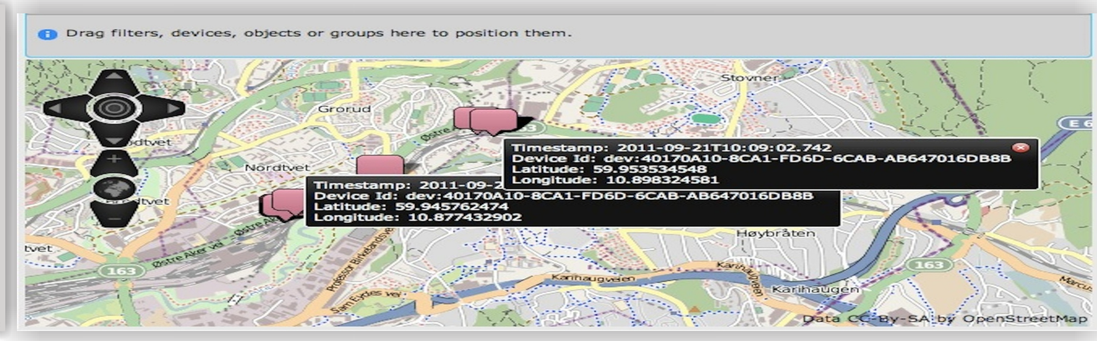
Time	Subject Id	Type	Unit	Value
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.x		0.8125
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.y		-0.265625
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.z		0.546875
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	altitude		-6378187
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	temperature	K	306.25
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	custom.id		0014.4F01.0000.7904
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.tilt	degrees	0.546875
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	longitude		0
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	latitude		0
2011-09-15T01:14:59.809	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	light		4

Sun SPOT Sensors + GPS Data

Time	Subject Id	Type	Unit	Value
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.x		0.765625
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.y		-0.21875
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.z		0.59375
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	altitude		105.426
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	temperature	K	299.65
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	custom.id		0014.4F01.0000.7904
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.tilt	degrees	0.59375
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	longitude		11.023202748
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	latitude		59.953428316
2011-09-21T11:10:12.628	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	light		7
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.x		0.765625
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.y		-0.21875
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.z		0.59375
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	altitude		105.746
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	temperature	K	299.65
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	custom.id		0014.4F01.0000.7904
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	axis.tilt	degrees	0.59375
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	longitude		11.024091487
2011-09-21T11:10:55.193	dev:40170A10-8CA1-FD6D-6CAB-AB647016DB8B	latitude		59.952114804

Roger Parked at JBV

Tracking Roger (Measurement Trip)



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