



DiaSuite

A methodology dedicated to orchestrating networked entities

**PHOENIX RESEARCH
GROUP**
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MARCH 2015

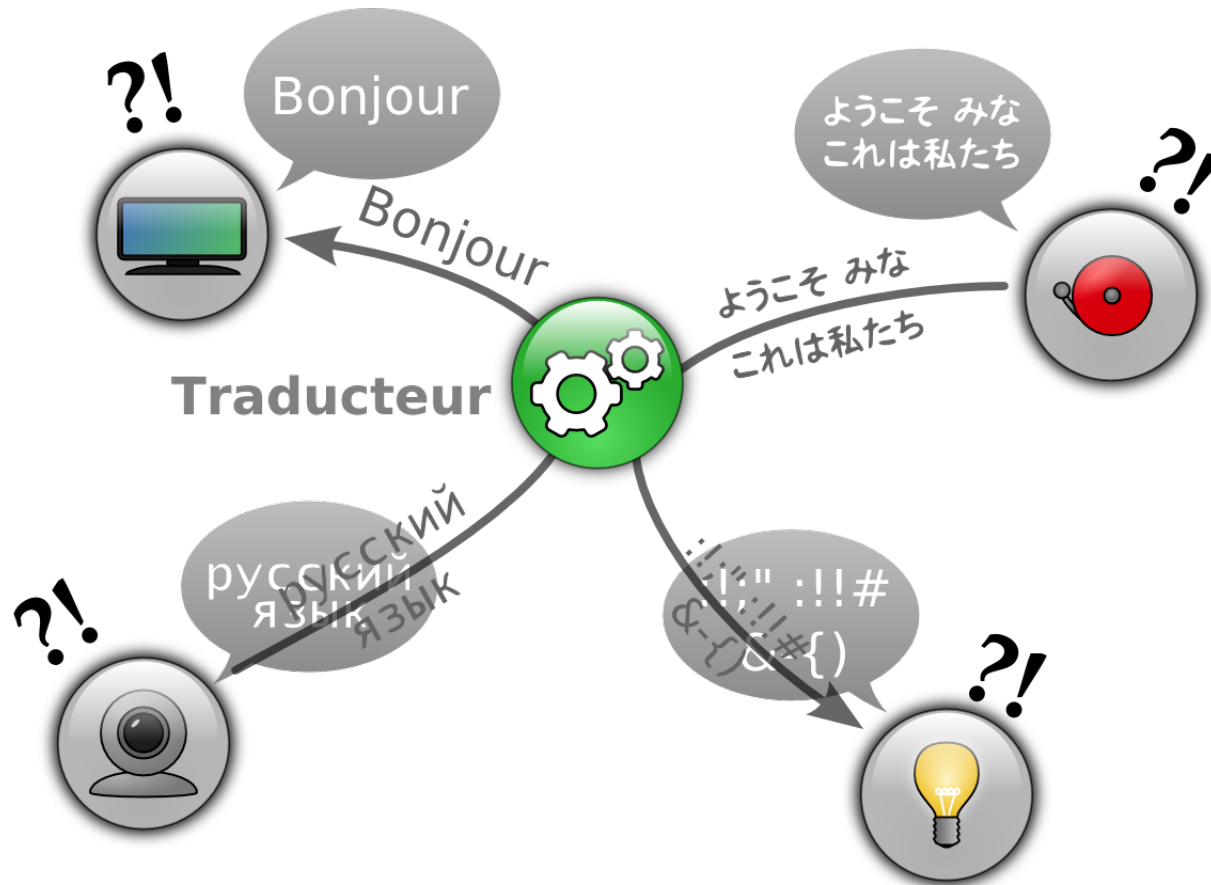
PHOENIX RESEARCH GROUP

- Inria Bordeaux Sud-Ouest
- Members
 - 4 researchers
 - 1 post-doc student
 - 2 engineers
 - 6 PhD students
- Research topic
 - Orchestration of networked entities

MULTIDISCIPLINARY TEAM

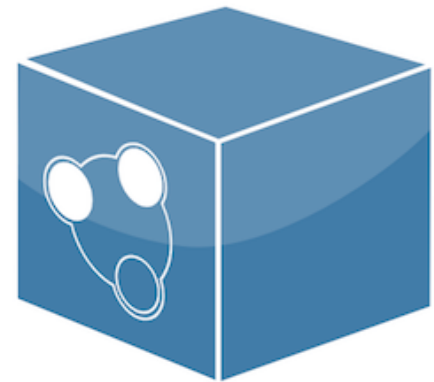
- Computer Science
 - Software engineering
 - Programming languages
 - Ubiquitous computing
- Cognitive sciences
 - Cognitive diagnosis and assessment
 - Digital assistive systems

ORCHESTRATION OF NETWORKED ENTITIES

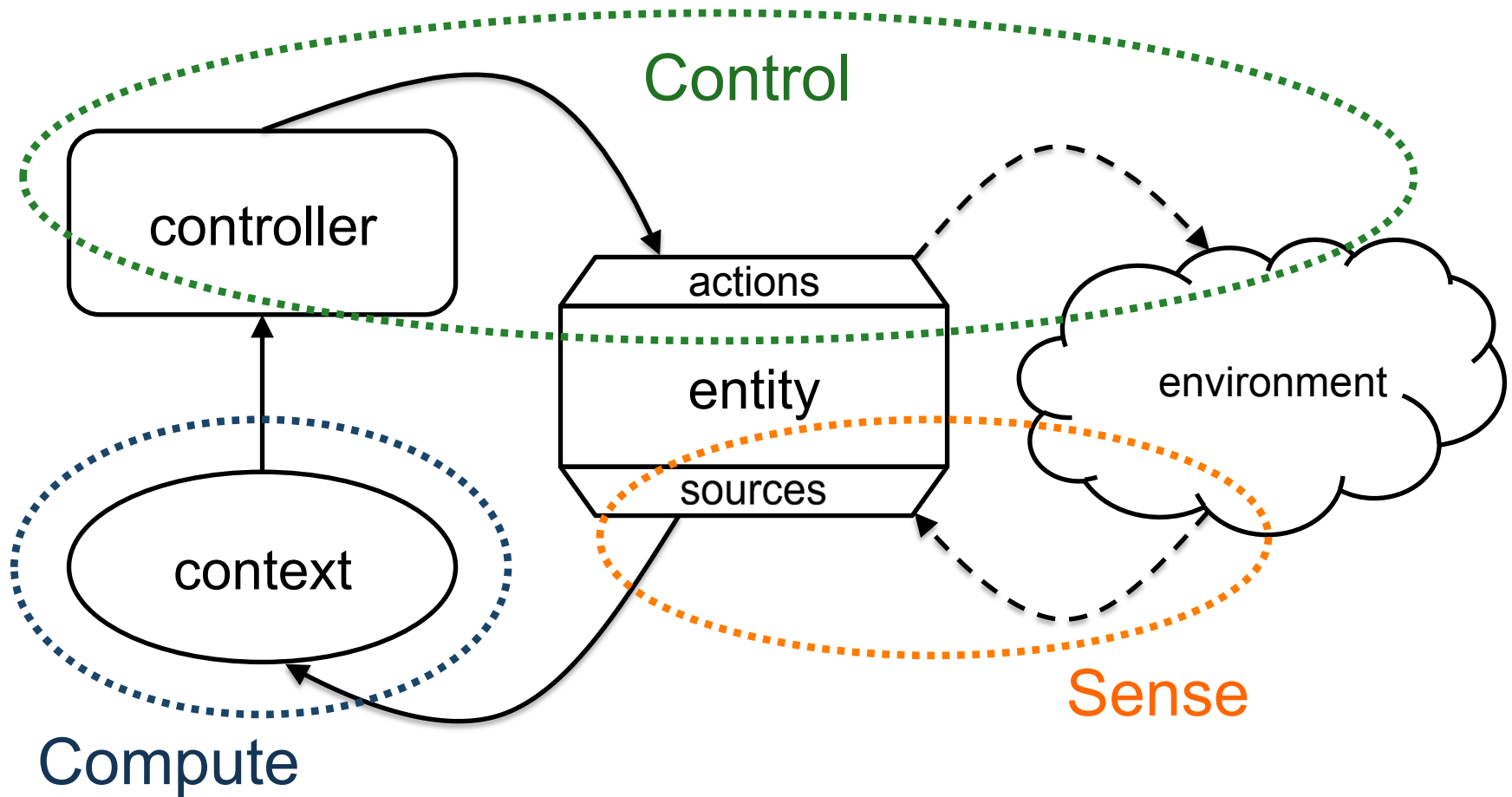


DIASUITE

- A tool-based development methodology
- Dedicated to orchestrating applications
- Design-driven methodology
- Provides support for each step of the development process



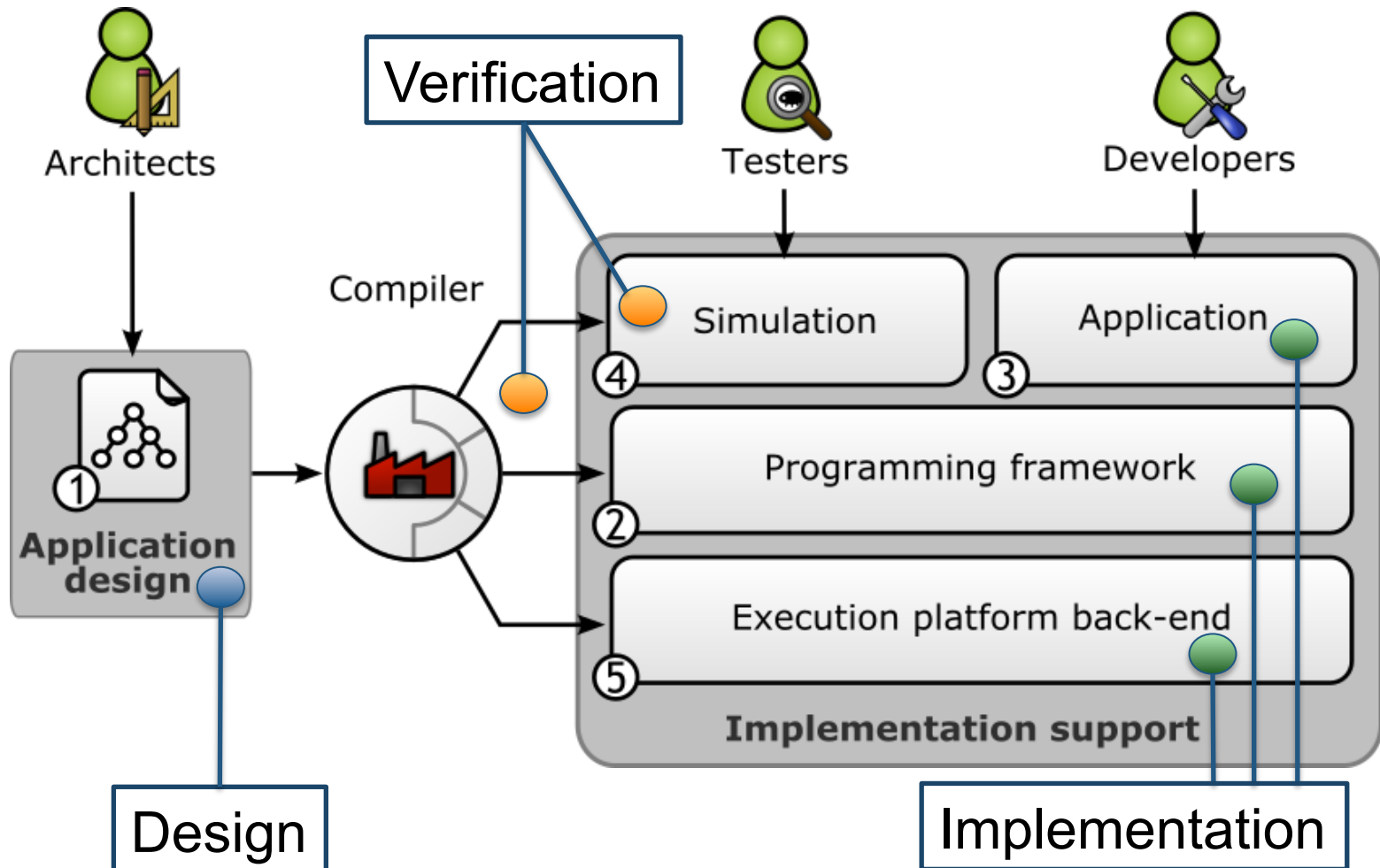
THE SENSE/COMPUTE/CONTROL PARADIGM





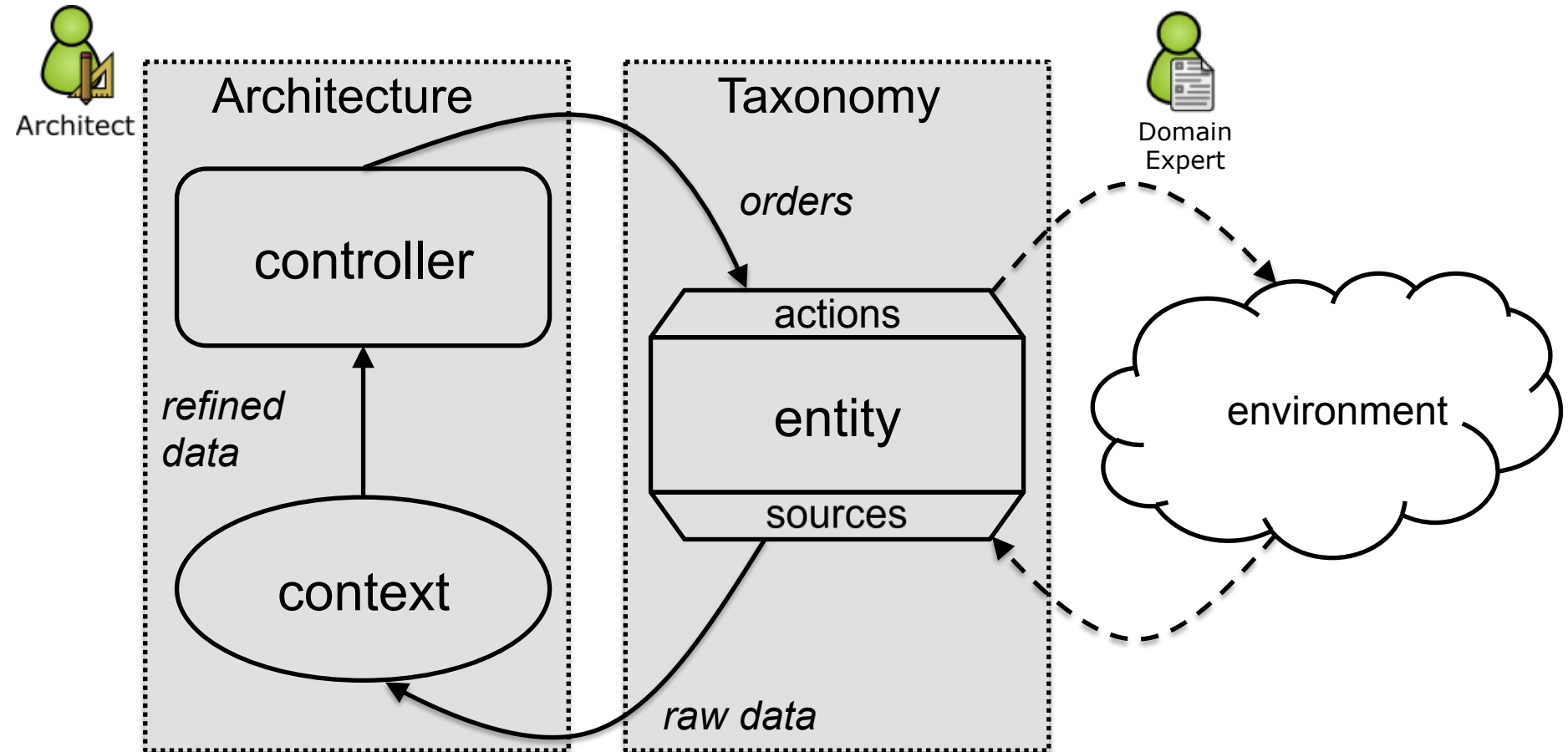
APPLICATION DEVELOPMENT STUDIO

DIASUITE IN DETAIL

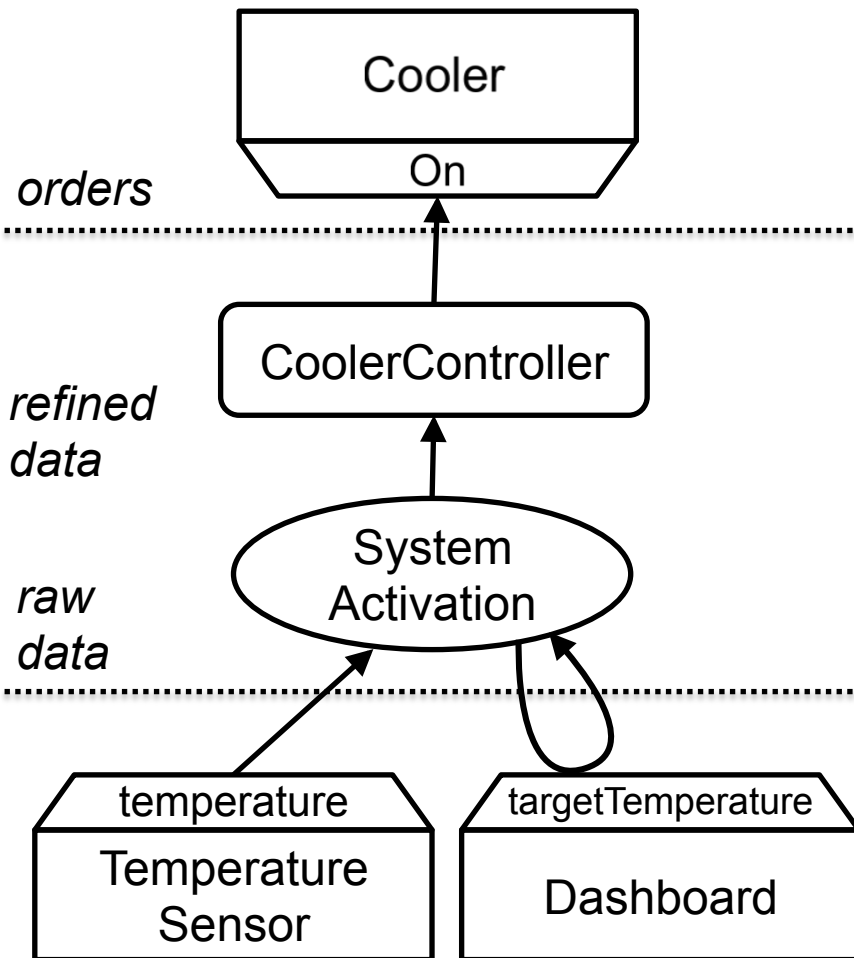


DESIGN

- DiaSpec design language is dedicated to the SCC paradigm



ENGINE COOLING SYSTEM IN DIASPEC



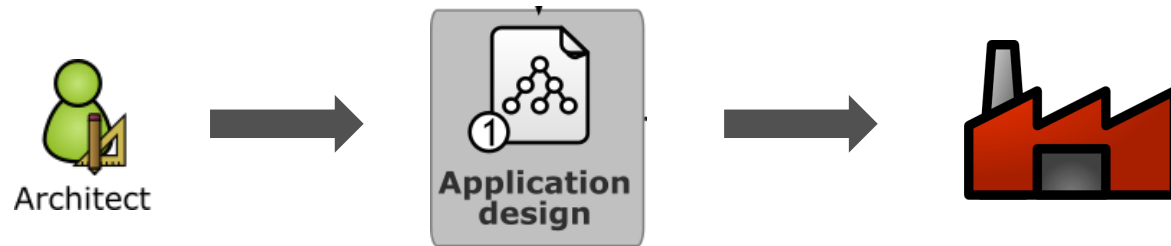
```
device Cooler {  
  action On;  
  [...]  
}
```

```
controller CoolerController {  
  when provided SystemActivation;  
  do On on Cooler;  
}  
context SystemActivation as Boolean {  
  when provided temperature from  
    TemperatureSensor;  
  get targetTemperature from Dashboard;  
}
```

```
device TemperatureSensor {  
  source temperature as Float;  
}  
device Dashboard {  
  source targetTemperature as Float;  
}
```

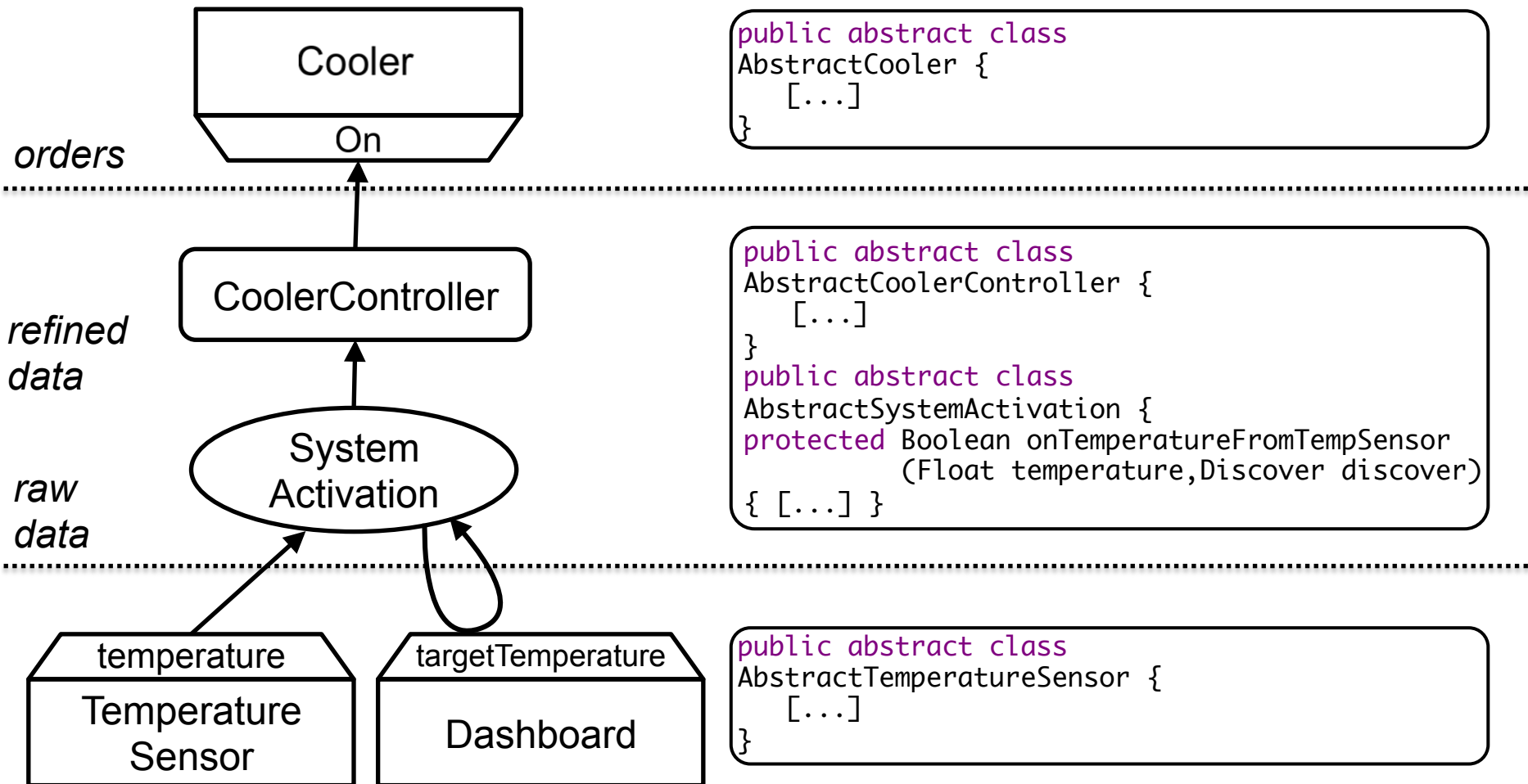
PROGRAMMING FRAMEWORK

- **DiaGen** generates a dedicated programming framework

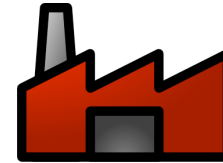


- The Framework
 - Guides the development of functional and non-functional aspects
 - Ensures conformity between design and implementation
 - Preserves the separation of functional and non-functional aspects

ENGINE COOLING SYSTEM IN DIASPEC



IMPLEMENTATION



```
context SystemActivation as Boolean {  
  when provided temperature from  
    TemperatureSensor;  
  get targetTemperature from Dashboard;  
}
```

DiaSpec



Architect



Developer

```
public abstract class  
AbstractSystemActivation {  
  protected Boolean onTemperatureFromTempSensor  
    (Float temperature,Discover discover)  
  { [...] }
```

Java

```
public class SystemActivation extends AbstractSystemActivation {  
  protected Boolean onTemperatureFromTempSensor  
    (Float temperature,Discover discover)  
  { [...] }
```

Java

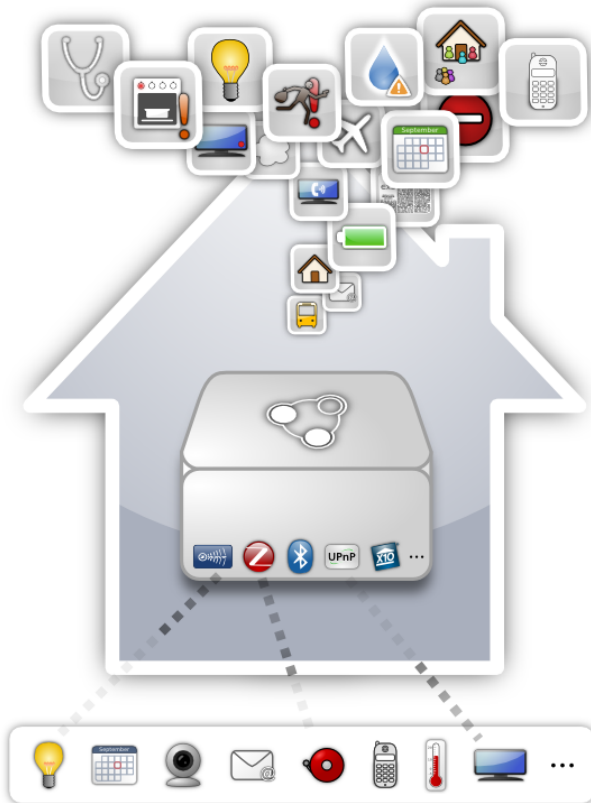


Implementation



DIASUITEBOX PLATFORM

DIASUITEBOX



- **An open application store**
- **Equipment evolution**
 - Plug-and-play and decoupling with applications
- **Application evolution**
 - Simplified management of installed apps
- **Sharing equipment between apps**
 - UPnP, Bluetooth, Z-Wave, SigFox, Zigbee

DIASUITEBOX (APPLICATIONS)



DIASUITEBOX (APPLICATIONS)



Retour

Surveillance de la porte



Notifie l'utilisateur en cas d'ouverture prolongée de la porte sans mouvement.





Version
7

Statut de l'application
Lancée 























Equipements nécessaires

-  Agenda
-  Clock
-  Contact Sensor
-  Motion Detector
-  Prompter

DIASUITEBOX (NETWORKED OBJECTS)







Equipements


-  **Activity Notifier** (ActivityNotifier) (State Unknown)
-  **Address Book** (GoogleAddressBookGoogle) (State Unknown)
-  **Agenda** (Agenda_Google) (State Unknown)
-  **Clock** (BuiltInClock) (State Unknown)
-  **Contact Sensor** (ContactSensor_21) (State Unknown)
-  **Contact Sensor** (ContactSensor_14) (State Unknown)
-  **Contact Sensor** (ContactSensor_24) (State Unknown)
-  **Cooker** (Cooker_12) (State Unknown)
-  **Electric Meter** (ElectricMeter_12) (State Unknown)
-  **Electric Meter** (ElectricMeter_3) (State Unknown)
-  **Light** (Light_4) (State Unknown)
-  **Light** (Light_5) (State Unknown)
-  **Light Sensor** (LightSensor_23) (State Unknown)
-  **Light Sensor** (LightSensor_16) (State Unknown)
-  **Mailer** (GoogleMail_Google) (State Unknown)
-  **Messenger** (Messenger11745) (State Unknown)
-  **Motion Detector** (MotionDetector_15) (State Unknown)
-  **Motion Detector** (MotionDetector_18) (State Unknown)
-  **Prompter** (Prompter19626) (State Unknown)
-  **Temperature Sensor** (TemperatureSensor_22) (State Unknown)
-  **Temperature Sensor** (TemperatureSensor_17) (State Unknown)
-  **Timer** (BuiltInTimer) (State Unknown)


verify

DIASUITEBOX (WEB SERVICES)




Système

Langue
Français  **Changer**

Pilotes de périphériques 

- ☒ **Activity Notifier** (fr.inria.phoenix.device.activitynotifier)
- ☒ **Clock** (fr.inria.phoenix.device.clock)
- ☒ **Google services** (fr.inria.phoenix.device.google)
- ☒ **Vera** (fr.inria.phoenix.device.vera)

Appliquer

Plateforme-cœur 

DIASUITEBOX (OSGI)

Apache Felix Web Console Bundles



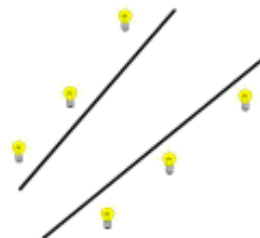
OSGi Web Console

Bundle information: 26 bundles in total - all 26 bundles active

x Apply Filter Filter All		Reload	Install/Update...	Refresh Packages	
<div><div></div><div></div></div> Id	<div><div></div><div></div></div> Name	<div><div></div><div></div></div> Version	<div><div></div><div></div></div> Category	<div><div></div><div></div></div> Status	<div><div></div><div></div></div> Actions
0	System Bundle (org.apache.felix.framework)	4.2.1		Active	
24	activity (fr.inria.phoenix.diasuite.apps.activity)	3.0.0.SNAPSHOT-2		Active	<div><div></div><div></div><div></div><div></div></div>
33	agendareminder (fr.inria.phoenix.diasuite.apps.agendareminder)	3.0.0.SNAPSHOT-8		Active	<div><div></div><div></div><div></div><div></div></div>
1	Apache Commons File Upload (com.springsource.org.apache.commons.fileupload)	1.2.0		Active	<div><div></div><div></div><div></div><div></div></div>
2	Apache Commons IO (com.springsource.org.apache.commons.io)	1.4.0		Active	<div><div></div><div></div><div></div><div></div></div>
4	Apache Felix Configuration Admin Service (org.apache.felix.configadmin)	1.8.0	osgi	Active	<div><div></div><div></div><div></div><div></div></div>
5	Apache Felix Http Jetty (org.apache.felix.http.jetty)	2.2.0		Active	<div><div></div><div></div><div></div><div></div></div>
6	Apache Felix Log Service (org.apache.felix.log)	1.0.1		Active	<div><div></div><div></div><div></div><div></div></div>
8	Apache Felix Remote Shell (org.apache.felix.shell.remote)	1.1.2	console	Active	<div><div></div><div></div><div></div><div></div></div>
7	Apache Felix Shell Service (org.apache.felix.shell)	1.4.3		Active	<div><div></div><div></div><div></div><div></div></div>
9	Apache Felix Web Management Console (org.apache.felix.webconsole)	4.2.4		Active	<div><div></div><div></div><div></div><div></div></div>
31	departurealarm (fr.inria.phoenix.diasuite.apps.departurealarm)	3.0.0.SNAPSHOT-6		Active	<div><div></div><div></div><div></div><div></div></div>
30	dooralarm (fr.inria.phoenix.diasuite.apps.dooralarm)	3.0.0.SNAPSHOT-7		Active	<div><div></div><div></div><div></div><div></div></div>
14	filelogservice (fr.inria.phoenix.diasuite.filelogservice)	3.0.0.SNAPSHOT		Active	<div><div></div><div></div><div></div><div></div></div>
17	fr.inria.phoenix.device.activitynotifier (fr.inria.phoenix.device.activitynotifier)	3.0.0.SNAPSHOT		Active	<div><div></div><div></div><div></div><div></div></div>
16	fr.inria.phoenix.device.clock (fr.inria.phoenix.device.clock)	3.0.0.SNAPSHOT		Active	<div><div></div><div></div><div></div><div></div></div>

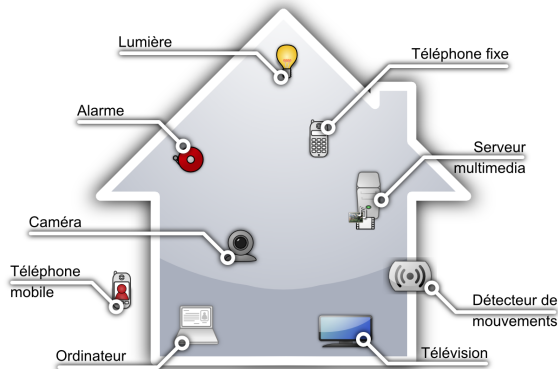
HOME DIGITAL ASSISTANCE EXAMPLES

- **Home digital assistance**
 - Light path, medical prescriptions management
- **Security**
 - Home exit management, home security, ...
- **Communication and social interaction**
 - Calendar, simplified communication, photo sharing, ...

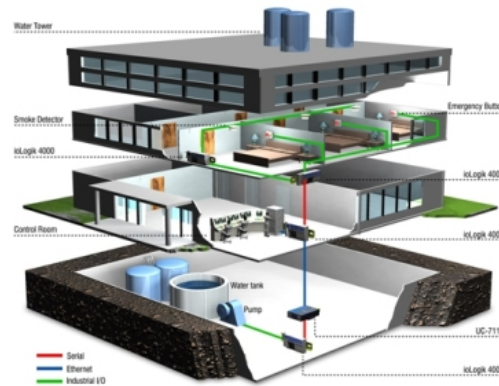


MATURE TECHNOLOGY

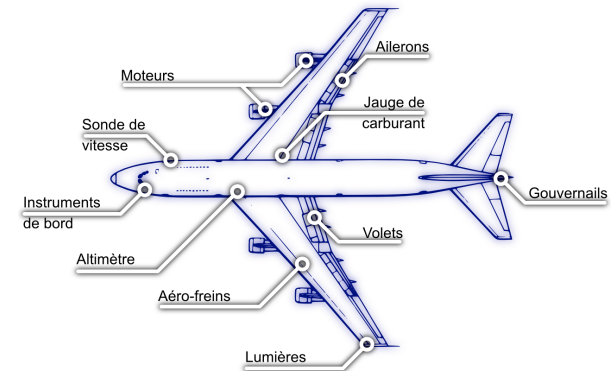
HOME AUTOMATION



BUILDING AUTOMATION



AVIONICS



- Building automation (ENSEIRB)
- Deployment on a realistic flight simulator
- Technology transfer in progress