Robotics Domain Task Force Final Agenda ver.1.0.3 robotics/2011-03-01

OMG Technical Meeting - Washington DC, USA -- March 21-25, 2011

http://robotics.omg.org/

		TF/SIG Host	TF/SIG Joint (Invited)	Agenda Item	Purpose	Room
Monday:						
12:00	13:00	**LUNCH**				
13:00	18:00			Architecture Board Plenary		
13:00	17:00			Robotics DDC4RTC and RoIS RFP submitters meeting(4h)	discussion	Delux King 700, 7th FL
Tuesday: WG activity						
9:00	12:00			**DDC4RTC** (Robotic Infrastructure) WG(3h) - Noriaki Ando (AIST) and Seung-Woog Jung (ETRI)	discussion	Delux King 862, 8th FL
				RoIS (Robotic Functional Services) WG(3h): - Su-Young Chi (ETRI), Miki Sato (JARA/ATR) and Toshio Hori (AIST)	discussion	Delux King 859, 8th FL
12:00	13:00	**LUNCH**				
13:00	18:00			**DDC4RTC** (Robotic Infrastructure) WG(5h) - Noriaki Ando and Seung-Woog Jung	discussion	Delux King 862, 8th FL
				RoIS (Robotic Functional Services) WG(5h): - Su-Young Chi, Miki Sato and Toshio Hori	discussion	Delux King 859, 8th FL
Wednesday: WG activitiy						
10:00	12:00			**DDC4RTC** (Robotic Infrastructure) WG(2h) - Noriaki Ando and Seung-Woog Jung	discussion	Washington B, Bllrm Lv1
				RoIS (Robotic Functional Services) WG(2h): - Su-Young Chi, Miki Sato and Toshio Hori	discussion	Washington B, Bllrm Lv1
12:00	14:00	**LUNCH and OMG Plenary**				
14:00	18:00			**DDC4RTC** (Robotic Infrastructure) WG(4h) - Noriaki Ando and Seung-Woog Jung	discussion	Washington B, Bllrm Lv1
				RoIS (Robotic Functional Services) WG(4h): - Su-Young Chi, Miki Sato and Toshio Hori	discussion	Washington B, Bllrm Lv1
18:00	20:00	**OMG Reception**				
Thursday: WG activitiy(am) and Robotics-DTF Plenary(pm)						
10:00	12:00			**DD4RTC** (Robotic Infrastructure) WG(3h) - Noriaki Ando and Seung-Woog Jung	discussion	Prince William, 3rd FL
				RoIS (Robotic Functional Services) WG(3h): - Su-Young Chi, Miki Sato and Toshio Hori	discussion	Prince William, 3rd FL
12:00	13:00	**LUNCH**				
13:00	18:00			Architecture Board Plenary		
13:00	14:00	Robotics		**PROTEUS project** **- Rioux Laurent** (THALES)	presentation and discussion	Prince William, 3rd FL
14:00	15:00	Robotics		**Conformace Testing Method for Robot Software Components** - **Mi-Sook Kim** (Seoul / Kangwon National University)	presentation and discussion	
				Break (30min)		
15:30	16:30	Robotics		WG Reports and Discussion (Service WG, Infrastructure WG, Models in Robotics WG)	presentation and discussion	
16:30	17:00	Robotics		Contact Reports: - Makoto Mizukawa(Shibaura-IT), and Young-Jo Cho(ETRI)	Information Exchange	
17:00	17:30	Robotics		Robotics-DTF Plenary Wrap-up Session (**DTF Co-Chair Election**, Roadmap and Next meeting Agenda)	Robotics plenary closing, **voting**	
17:30				Adjourn joint plenary meeting		
17:30	18:00			Robotics WG Co-chairs Planning Session (Preliminary Agenda for next TM, Draft report for Friday)	planning for next meeting	
Friday						
8:30	12:00			AB, DTC, PTC		
12:00	13:00	**LUNCH**				

Other Meetings of Interest

Monday						
8:00	8:45	OMG		New Attendee Orientation		Arlington, 3rd FL
9:00	17:00	OMG		System Assurance Information Day		Conference Theatre, Bllrm Lv1
9:00	12:00	OMG		Introduction to OMG Specification Tutorial		Arlington, 3rd FL
Tuesday						
7:30	9:00	OMG		Liaison ABSC		Prince William, 3rd FL
8:30	17:30	OMG		Executablr UML Information Day		Roosevelt, 3rd FL
9:00	15:00	OMG		Realtime and Embedded Systems Workshop		Conference Theatre, Bllrm Lv1
17:00	18:00	OMG		RTF-FTF Chair's Workshop		Prince William, 3rd FL
Wednesday						
8:30	17:00	OMG		Realtime and Embedded Systems Workshop		Washington A, Ballrm Lv1
8:30	17:00	OMG		C4I Information Day		Jefferson, 3rd FL
9:30	11:00	OMG		New activity meeting with Richard Soley (private)		Suite 1834, 18th FL
Thursday						
9:00	17:00	OMG		Realtime and Embedded Systems Workshop		Conference Theatre, Bllrm Lv1
8:30	17:30	OMG		Developing Enabling Standards for MIEM and ISE Workshop		Lincoln, 3rd FL
13:00	16:30	OMG		Record Management Service Workshop		Fairfax, 3rd FL
9:00	17:00	SysA		System Assurance PTF		Arlington, 3rd FL

Please get the up-to-date version from http://staff.aist.go.jp/t.kotoku/omg/RoboticsAgenda.pdf

Minutes of the Robotics DTF Meeting

December 6-10, 2010

Santa Clara, CA, USA

(robotics/2011-03-02)

Meeting Highlights

- Two initial submissions for the Dynamic Deployment and Configuration for Robotic Technology Component (DDC4RTC) RFP were presented in the joint plenary with MARS-PTF.
- Two initial submissions for the Robotic Interaction Service (RoIS) Framework RFP were presented.
- As a special talk, "(How we are) Building Blocks for Mobile Manipulation (that you can reuse)" was presented by Dr. Brian Gerkey (Willow Garage) [robotics/2010-12-06].
- Robotic Technology Component (RTC) 1.1 RTF was chartered [robotics/2009-12-17, 18].
- Additional DTF Co-Chair election was announced.

List of Generated Documents

robotics/2010-12-01 Final Agenda (Tetsuo Kotoku)
robotics/2010-12-02 Cambridge Meeting Minutes [approved] (Takashi Tsubouchi and Tetsuo Kotoku)
robotics/2010-12-03 Opening Presentation (Tetsuo Kotoku)
robotics/2010-12-04 ETRI Presentation of Robotic Interaction Service Framework (RoIS) Initial Submission (Su-Young Chi)
robotics/2010-12-05 JARA Presentation of Robotic Interaction Service Framework (RoIS) Initial Submission (Toshio Hori)
robotics/2010-12-06 Special Talk: (how we are) Building Blocks for Mobile Manipulation (that you can reuse) (Brian Gerkey)
robotics/2010-12-07ETRI Presentation of Dynamic Deployment and Configuration for RTC (DDC4RTC) Initial Submission (Seung-Woog Jung)
robotics/2010-12-08 AIST Presentation of Dynamic Deployment and Configuration for RTC (DDC4RTC) Initial Submission (Geoffrey Biggs)
robotics/2010-12-09 Robotic Functional Services WG Minutes (Dec. 6-7, 2010) (Miki Sato)
robotics/2010-12-10 ETRI Presentation of Dynamic Deployment and Configuration for RTC (DDC4RTC) Initial Submission [mars/2010-12-24] (Seung-Woog Jung)
robotics/2010-12-11 AIST Presentation of Dynamic Deployment and Configuration for RTC (DDC4RTC) Initial Submission [mars/2010-12-25] (Geoffrey Biggs)
robotics/2010-12-12 RoIS Framework Tracking Issue (Su-Young Chi)
robotics/2010-12-13 Wrap-up Presentation (Tetsuo Kotoku)
robotics/2010-12-14 Robotic Infrastructure WG Report (Seung-Woog Jung)
robotics/2010-12-15 Robotic Functional Services WG Report (Toshio Hori)
robotics/2010-12-16 The 5th Korea-Japan-China Joint Workshop on Robotics (Young-Jo Cho)
robotics/2010-12-17 RTC-RTF Proposal (Geoffrey Biggs)
robotics/2010-12-18 Charter for RTC-RTF (Geoffrey Biggs)
robotics/2010-12-19 Roadmap for Robotics Activities (Tetsuo Kotoku)
robotics/2010-12-20 Next Meeting Preliminary Agenda - DRAFT (Tetsuo Kotoku)
robotics/2010-12-21 DTC Report Presentation (Young-Jo Cho)
robotics/2010-12-22 SantaClara Meeting Minutes - DRAFT (Miki Sato and Myung-Eun Kim)

Minutes

Monday, Dec 06, 2010, Winchester, 2nd FL
Robotics DTF Plenary Meeting

8:40-9:00 Robotics DTF Opening Session, Chair: Dr. Kotoku, Quorums: 3
AIST, ETRI, JARA, KAR, Shibaura IT, Univ. of Tsukuba, UEC, Toshiba, Technologic Arts, ATR

- Minutes takers: Miki Sato (ATR) and Myung-Eun Kim (ETRI)
- Cambridge Meeting Review will be on Wednesday
- Agenda Review
    . Monday:
        Initial Submission Presentation for RoIS RFP (Su Young Chi/ETRI)
        Initial Submission Presentation for RoIS RFP (Toshio Hori/AIST)
        Special Talk (Brian Gerkey/Willow Garage)
    . Tuesday:
        Robotic Infrastructure WG/Robotic Functional Services WG
    . Wednesday:
        Joint Plenary with MARS
            .. Initial Submission Presentation for DDC4RTC RFP (Seung-Woog Jung/ETRI)
            .. Initial Submission Presentation for RoIS RFP (Geoffrey Biggs/AIST)
        WG and Contact Reports, Wrap up

09:00-10:00 Initial Submission Presentation for RoIS RFP, Winchester, 2nd FL
- Initial Submission Presentation for RoIS RFP, Su Young Chi, ETRI, Korea
- Proposed lists of messages for 3 interface in RoIS Framework (Event, Command, Query).
- HRI specified functions with BioAPI & RLS are included in APIs of HRI engine.
- Presentation of experimental demonstration for human tracking

10:00-11:00 Initial Submission Presentation for RoIS RFP, Winchester, 2nd FL
- Initial Submission Presentation for RoIS RFP, Toshio Hori, AIST, Japan
- Proposed sequences and messages for 4 interface types (System, Event, Command, Query).
- Profiles of the messages are defined for functionality of HRI engine and components.
- Some comments for consideration of robot mobility, e.g. human tracking
- Some comments for specific scenario of Dialog Action

11:00-12:00 Special Talk: Brian Gerkey (Willow Garage),
- Title: (How we are) Building blocks for mobile manipulation (that you can re-use)
- Introduced how to build blocks: document, test, release.
- The status of building blocks for mobile manipulation in Willow Garage.
- Introduced some field experiments for building blocks for PR2 e.g. opening a door, plugging-in, fetching beer.
- Automated regression tests are conducted on a simulator for each task.
- Wiki pages and packaged codes are prepared for each experiment to improve reproducibility.

Wednesday, Dec 08, 2010, Bayshore E, 2nd FL
Robotics DTF Plenary Meeting

14:00-16:00 Joint Plenary with MARS, Laurence, 2nd FL
- Initial submission presentation for DDC4RTC, Seung-Woog Jung, ETRI, Korea
- Initial submission presentation for DDC4RTC, Geoffrey Biggs, AIST, Japan
- Future plan for the revised submission
    . AIST and ETRI have discussed how to merge two initial submissions and they will make the revised submission by merging them.

16:00-16:10 Infrastructure WG, Seung-Woog Jung (ETRI)
- ETRI and AIST presented their own initial submissions on Monday.
  . Exchanged some comments for each initial submission.
  . Discussed how to merge ETRI and AIST initial submissions.
- ETRI and AIST got some comments from MARS plenary on Wednesday.
  . It is required to merge two initial submissions.
- Future schedule will be fixed on Thursday.

16:10-16:20 Functional Service WG, Toshio Hori (AIST)
- ETRI and JARA presented their initial submissions on Monday.
- ETRI and JARA reached an agreement to merge two initial submissions based on JARA's proposal.
- ETRI and JARA reviewed JARA's proposal in detail and clarified the problems.
- Future plan of private meeting for proposal.
  . 2011.01.20 – 2011.01.22 in Japan

16:20-16:25 Functional Service WG Minutes, Miki Sato (ATR)
- Presented the review of JARA's proposal for RoIS RFP.
- Presented the problems for revising the proposal based on discussion.

16:25-16:35 Contact Report, Young-Jo Cho (ETRI)
- The 5th Korea-Japan-China Joint Workshop on Robotics was held in KINTEX, Korea, Oct. 29, 2010
- Presented Robotics R&BD policies in three countries.
- Presented pioneering efforts for service robot industrialization in three countries.
- Presented experiences and challenges in robotics technologies.
- Presented stats and perspective of robotics standardization.

16:35-17:15 RTC 1.1 RTF Proposal, Geoffrey Biggs (AIST)
- Proposed to make a RTC standard revision Task Force.
- Presented the revision parts of the RTC specification.
- The Revision scope is restricted to fix trivial problems.
- ETRI suggested joining the revision task force to modify the RTC specification.
  The suggestion of the modification will be posted as comments.
- Agreement to make a RTC RTF
  . Members:
    Geoffrey Biggs(chair)(AIST)
    Takeshi Sakamoto(Technologic Arts)
    Seung-Woog Jung(ETRI)
    Chul-Jong Hwang(KAR)
    Takashi Suehiro(UEC)
    Makoto Mizukawa(Shibaura IT)
    Saku Egawa(Hitachi)
    Noriaki Ando(JARA/AIST)
  . Comments Due Date: June 01, 2011
  . Report Due Date: Aug. 22, 2011
  . Report Deadline: Sep. 30, 2011
- The motion of this charter will be made on MARS.

17:15-17:30 Wrap-up Session, Chair: Dr. Kotoku (AIST)
- Laurent Rioux (Thales) won't attend Robotics-DTF as a DTF/WG chair.
- We would like to thank Laurent for his contribution.
- It is required to elect a new co-chair of Robotics-DTF in next meeting.
- Suspend Modeling for Robotics WG activity.
- Next Meeting Agenda (03/22(Tue.) – 03/24(Thur.) in Washington D.C)

ATTENDEE (18 participants)

- Brian Gerkey (Willow Garage)
- Chul-Jong Hwang (KAR)
- Geoffrey Biggs (AIST)
- Katsuhiro Mayama (Shibaura IT)
- Makoto Mizukawa (Shibaura IT)
- Miki Sato (ATR)
- Miwako Doi (Toshiba)
- Myung-Eun KIM (ETRI)
- Noriaki Ando (AIST)
- Seung-Woog Jung (ETRI)
- Su-Young Chi (ETRI)
- Takashi Suehiro (Univ. of Electro-Communication)
- Takashi Tsubouchi (Univ. of Tsukuba)
- Takeshi Sakamoto (Technologic Arts)
- Tetsuo Kotoku (AIST)
- Toshio Hori (AIST)
- Young-Jo Cho (ETRI)
- Yusuke Zama (Shibaura IT)

Remote ATTENDEE through the GoToMeeting (one participant)

- Ingo Lütkebohle (Bielefeld Univ.)

Prepared and submitted by Miki Sato (ATR) and Myung-Eun Kim (ETRI)

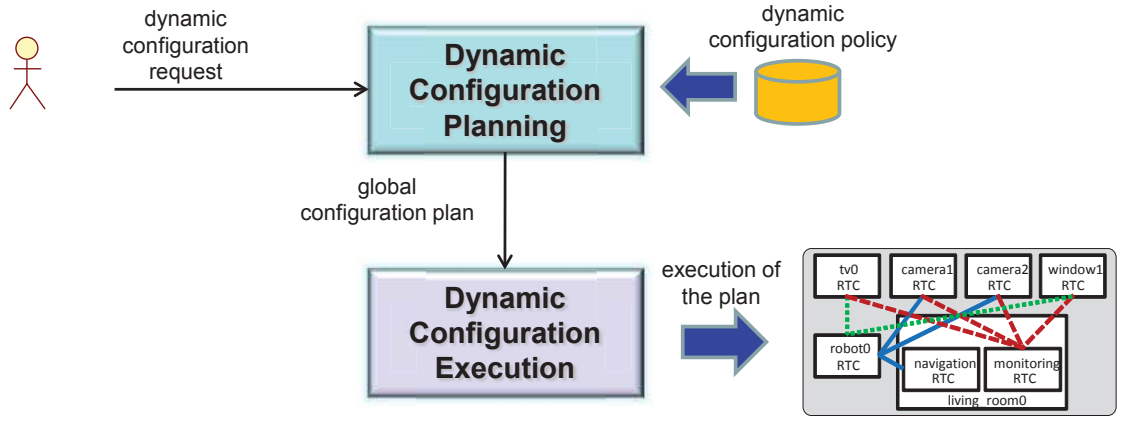
Review of ETRI Initial Submission

OMG Meeting March 21-25, 2011 Arlington

Seung-Woog Jung
Infrastructure WG, Robotics DTF
ETRI, KOREA

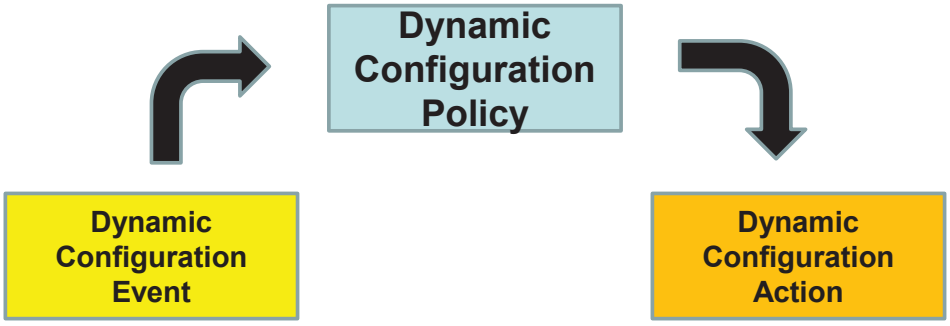
Dynamic Configuration Process

- Dynamic Configuration Planning Process
  - the act of taking a dynamic configuration request and generating a global configuration plan based on the predefined dynamic configuration policies
- Dynamic Configuration Execution Process
  - a process which takes a global configuration plan and executes the dynamic configuration based on the global plan



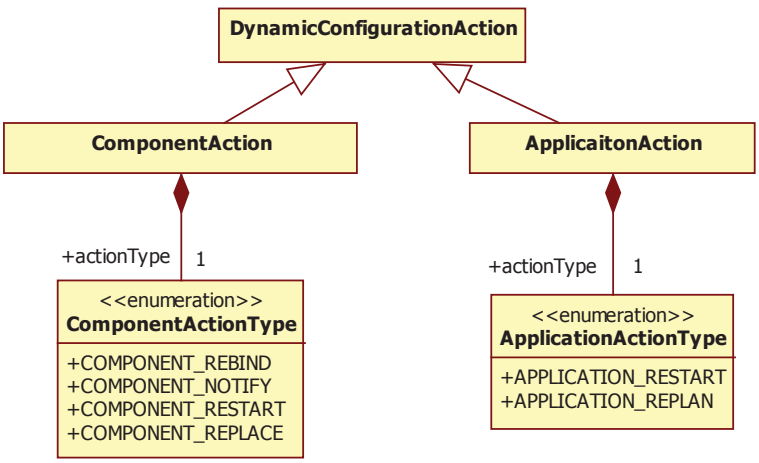
Dynamic Configuration Policy

- A DynamicConfigurationPolicy describes what kind of configuration actions should be done when a configuration event occurs.



Dynamic Configuration Action

- There are several ways to configure a system dynamically.
- The DynamicConfigurationAction describes information of how to configure the system.
- A dynamic configuration action can be applied to a component or an application. Therefore it has two child classes, ComponentAction and ApplicationAction.



How to apply policy concept to DDC4RTC

OMG Meeting March 21-25, 2011 Arlington

Seung-Woog Jung
Infrastructure WG, Robotics DTF
ETRI, KOREA

Why Event & Policy for Reconfiguration

- Montanari, R., Tonti, G., Stefanelli, C., “Policy-Based Dynamic Reconfiguration of Mobile-Code Applications”, Proceedings of 27th Computer Software and Applications Conference(COMPSAC), 2003.
  - an event-driven model is a natural candidate for notifying distributed components of changes that occur in both application and system state
  - declarative policies let programmers directly express what reconfiguration is needed without having to specify how to achieve it, thus facilitating the definition of reconfiguration strategies
  - declarative policy specifications are amenable to policy analysis and verification. Unlike policies buried in implementation code, declarative policies can be validated externally. for example, via theorem-provers.as sufficient and correct for the application reconfiguration.

Why Event & Policy for Reconfiguration

- Examples

(a) Generic policy type

```
inst oblig policyName "{"
on        event-specification;
subject   domain-Scope-Expression;
target    domain-Scope-Expression;
do        obligation-action-list;
when      constraint-Expression;
"}"
```

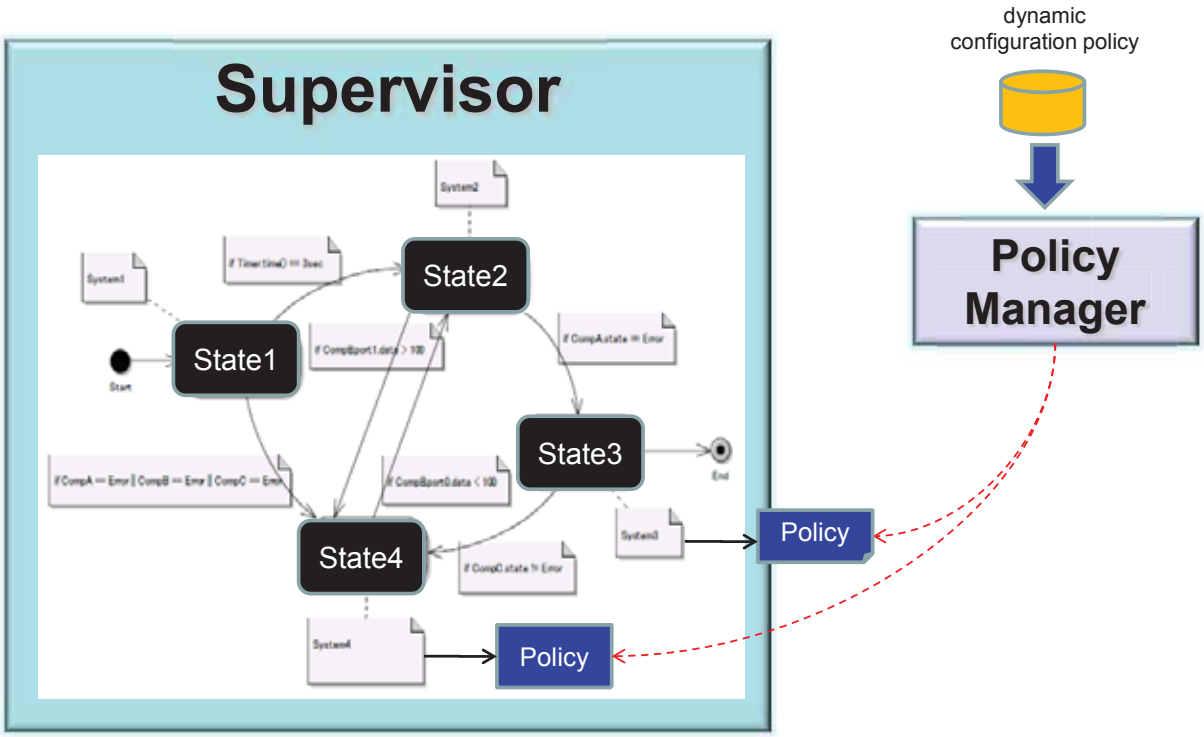
(b) Personal assistant policy instances

```
domain a = /PoemaOrganisationID/DomainID;
inst oblig UserMobility_P1 {
on        ChangeDevice(userName, deviceName);
subject   s = a/siteA/UserProxyID;
target    t = a/siteA/UserProxyID;
do        t.go((deviceName.getSite()).toString(), "run()");
when      MonitoringSystem.checkResStatus(deviceName) = = true;
}
```

(c) Personal assistant policy types

```
domain a = /PoemaOrganisationID/DomainID;
type oblig UserMobility (subject s, target t) {
on        ChangeDevice(userName, deviceName);
do        t.go((deviceName.getSite()).toString(), "run()");
when      MonitoringSystem.checkResStatus(deviceName) = = true;
}
inst oblig UserMobility_P1 = UserMobility(a/siteA/UserProxyID, a/siteA/UserProxyID)
```

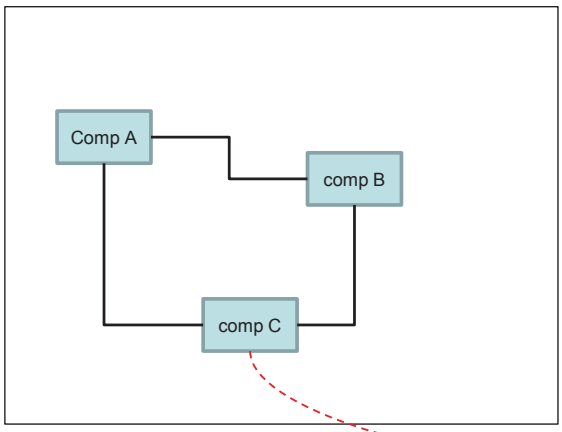

Option 1 : Application of Policy



Option 1: Example

- In a state

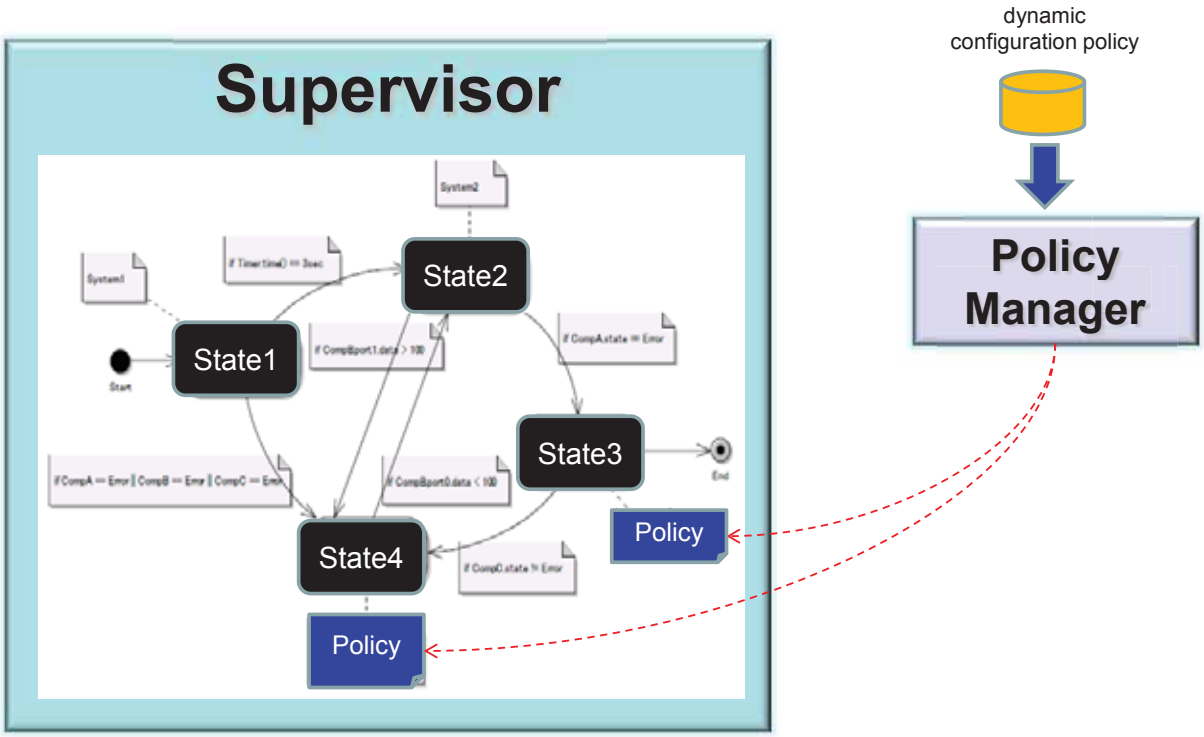
[RTC-based system]



[policy]

```
action :
  Rebind("comp C", $new_comp)
  with $new_comp.loc = "room1"
```


Option 2 : Application of Policy



Option 2 : Example

- In a state

[policy 1]

```
on :
  RobotLocationChanged($loc)

action :
  Rebind("Camera", $new_comp)
  with $new_comp.loc = $loc
```

[policy 2]

```
on :
  RobotLocationChanged($loc)

action :
  NewRTCSystem("system4")
```

- Policy specification

```
on :
  event_name(param1, param2,…)

action :
  action_name($param1, param2)
  with search_condition
```

robotics/2011-03-05

Discussion Issues for supervision tree

2011.03.22

Myung-Eun Kim
ETRI

RTC Application Tree

- RTC applications can be arranged in trees
- Sub-applications each have their own supervisors responsible for their application's components

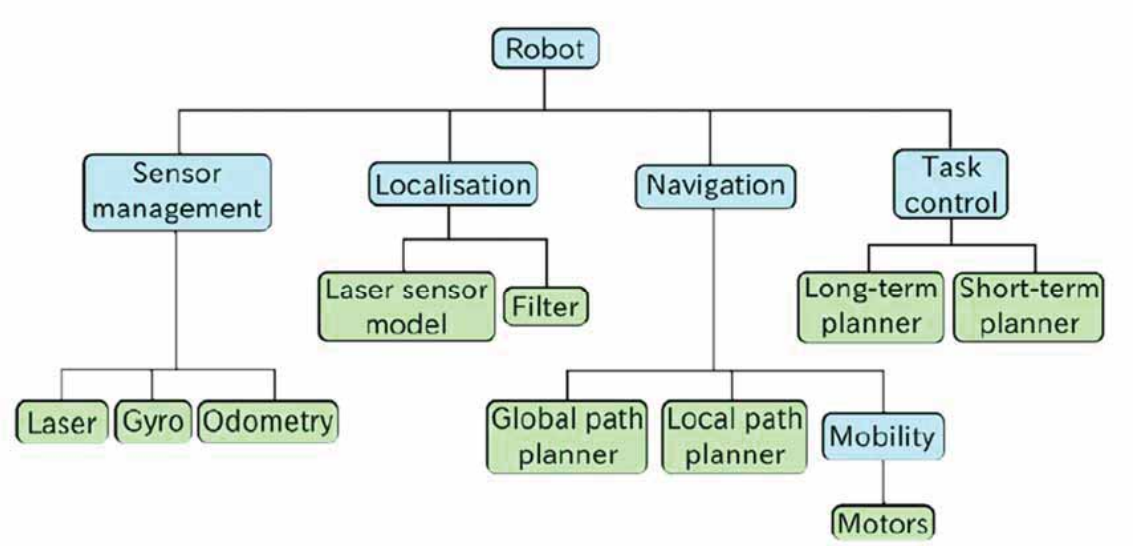
Supervision Tree

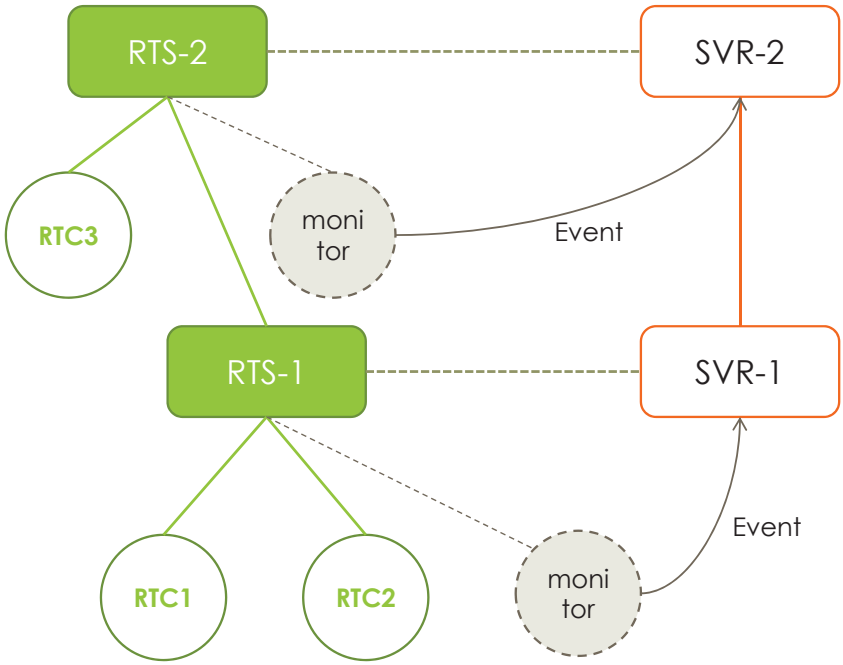
- The Supervisor is the core component responsible for managing the redeployment of an RT-System at runtime
- Supervisors are arranged in a tree structure, known as the Supervision Tree
- Supervisor is responsible for monitoring the condition of all components and child supervisors under its control by pre-determined conditions

Supervision Tree

- The RT-System can communicate events to the supervisor using event service interface as they occurs
- The failure in RT-System can be handled locally by the supervisor. If not, the error propagates up to the tree until one is found that can handle the error

Supervision tree example

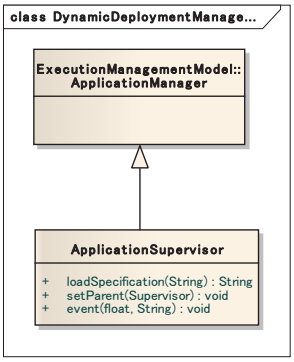




ApplicationSupervisor

- A unique entity within an RTC Application
- It is responsible for managing the lifetimes of the RT Components that make up the RTC application
- ApplicationSupervisor maintains
  - A collection of RTCs participating in the RTC Application at the present
  - A store of RTCProfiles describing RTCs that may potentially participate in the RTC Application, including those that are currently participating
  - A store of RTSProfiles describing deployment that may be executed by the SupervisorFSM

ApplicationSupervisor



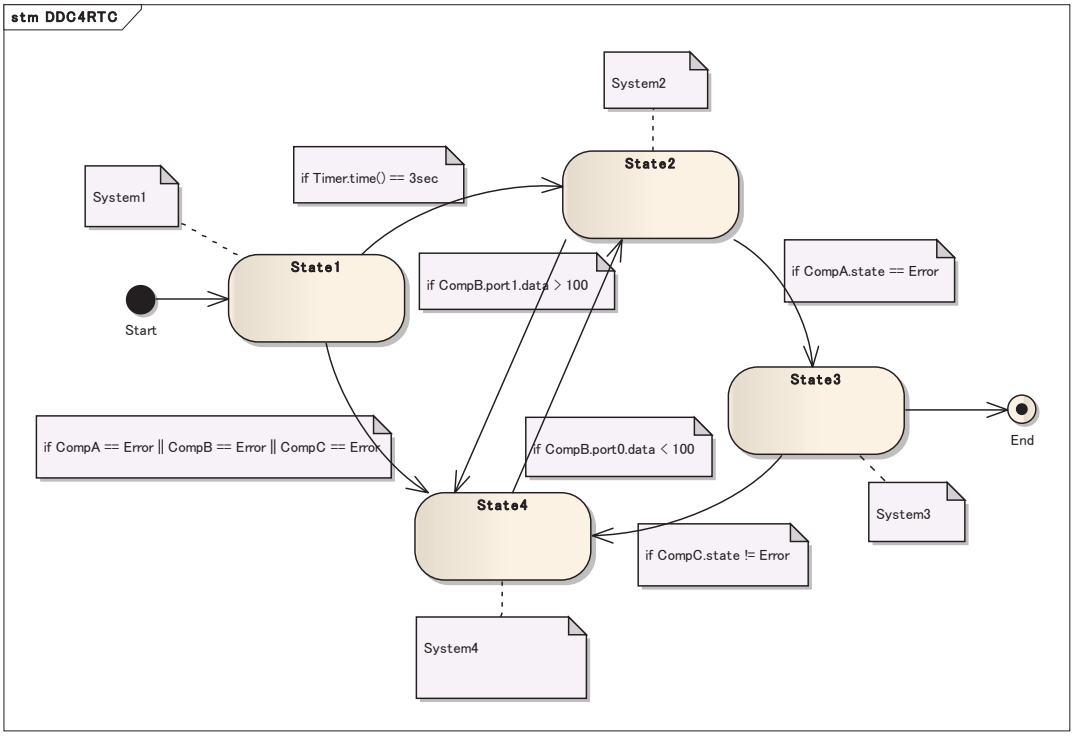
- ApplicationManager
  - startLaunch()
  - destroyApplication()
- ApplicationSupervisor
  - loadSpecification (String)
  - setParent (Supervisor)
  - Event (float, event)

SupervisorFSM

- The behavior of the SupervisorFSM is that of a Finite State Machine
- Each state in the FSM constitutes a set of one ~~or more~~ non-overlapping developments, where each deployment is specified by an RTSProfile, referencing RTCProfiles stored by the SupervisorFSM

SupervisorFSM

- Once the initial state's deployment is complete, the SupervisorFSM enters a waiting state
- Reception of an event causes it to evaluate the current state's transitions
- If a transition is valid, the SupervisorFSM shall transition to that state, executing the new deployment it specific
- If the transition leads to a final state, the SupervisorFSM shall execute its shutdown procedure



Issues for discussion

- If developers should pre-define the redeployment plan when they deploy an application, how could they describe it?
  - Does it mean SupervisorProfile?
  - Does the redeployment plan include the whole redeployment and the partial redeployment?
- If a state could have several redeployment plans, how could it select one?

Think more…

- It is very needed to have more scenarios to make a general standard specification
  - Don't we have to cover all kind of robots like visible robot, invisible robot, and unconscious robot?
  - Do we consider some scenarios which different types of robots cooperate?
  - We should consider various situations which need dynamic redeployment and reconfiguration
    - System failure, RTC failure
    - Environment change, application requirements

robotics/2011-03-06

How to apply the repository and directory to the supervision tree?

2011.03.22

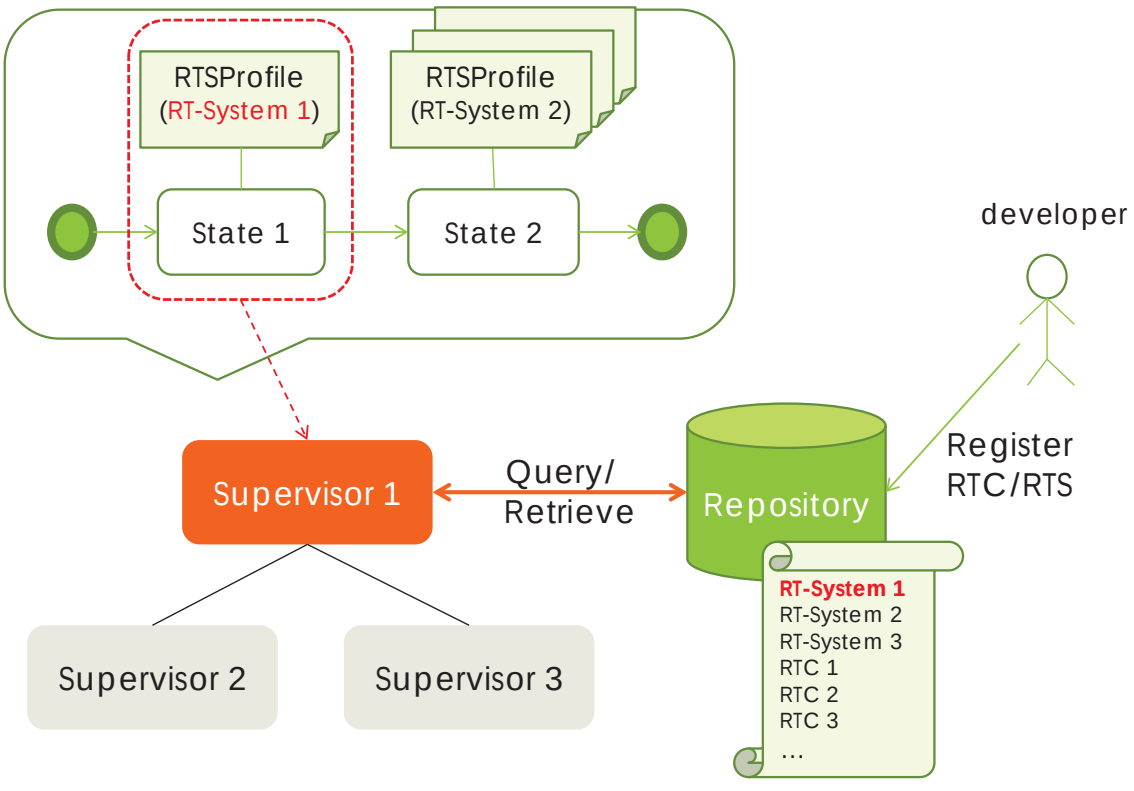
Myung-Eun Kim
ETRI

Repository Manager

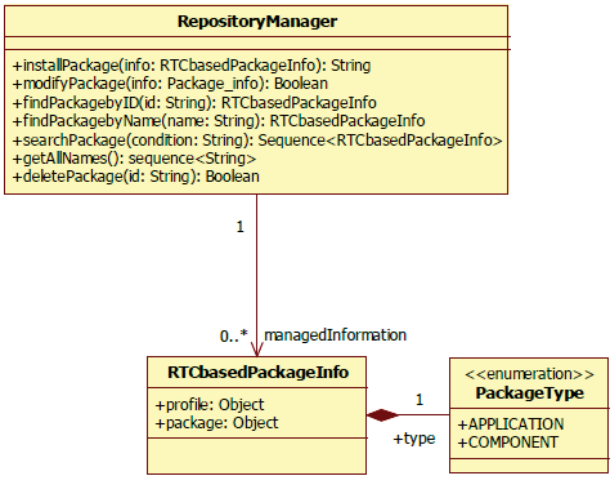
- The repository is a kind of storage which manages RTC/RTS packages, including RTCProfile and RTSProfile, by developers
- The RepositoryManager has a responsibility to manage a repository

Issues for discussion

- How could the supervisor node use the repository during the redeployment process
  - If the supervisor node has a set of RTSProfiles as redeployment plans, it should get RTCs which are components of the RT-System before redeployment process
  - Would it be possible the supervisor node to search appropriate RTCs in the repository?



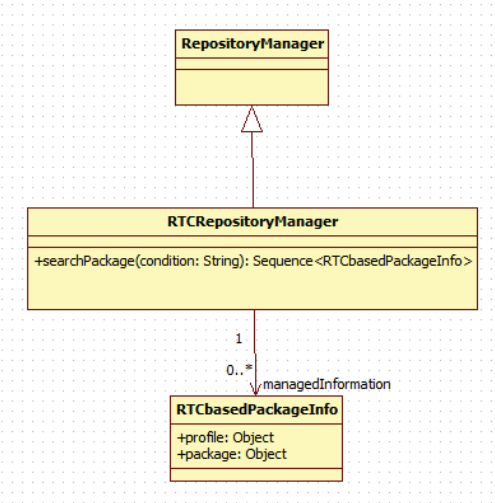
Repository Manager



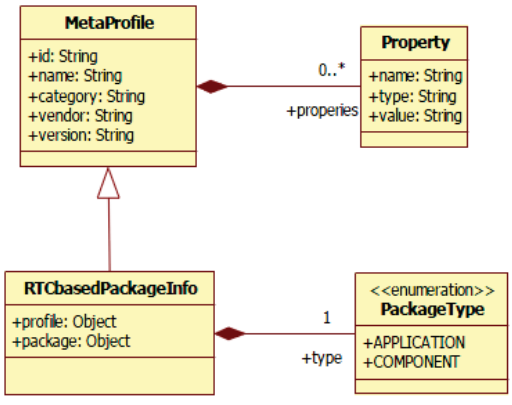
Issues for discussion

- How would it change the name of the repository manager to 'RTCRepositoryManager to clarify meaning?
- The RTCRepositoryManager has duplicated operations with the RepositoryManager in CCM spec.
  - It would be better to inherit from the RepositoryManager in CCM
- Don't we need to store RTS packages in the repository?
  - If so, it is needless to classify packages by package type (application/component) in a repository
- Do we need Any other operations?

RTCRepositoryManager



RTCbasedPackageInfo



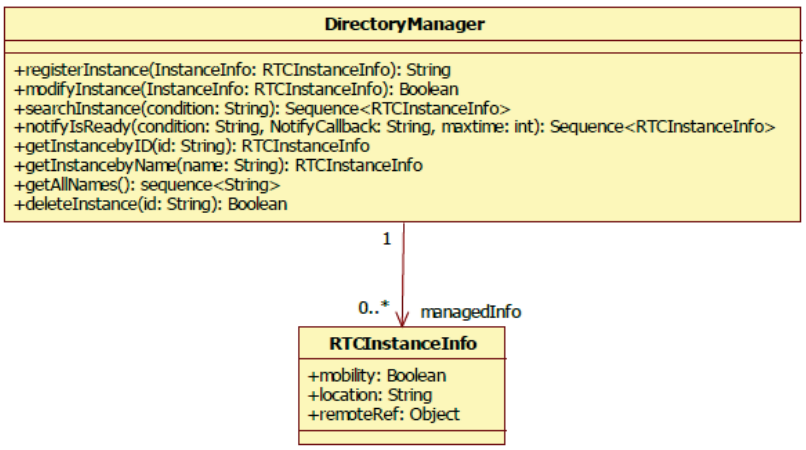
Issues for discussion

- What kind of information could be used as a search keyword in the repository? Anything else?
  - Id
  - Name
  - Category name
  - Vendor name
  - Version number
  - User defined properties

Directory

- It is a kind of storage to manage the information of RTC instances
  - The DirectoryManager has a responsibility to manage a directory

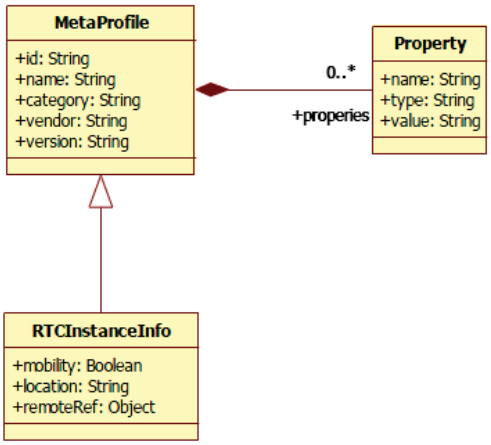
DirectoryManager



Issues for discussion

- How could the supervisor node use the directory during reconfiguration process?
  - When does the supervisor node need the information of running RTCs?
    - if a developer should predefine and deploy redeployment plans with an application, it would be hard developers to predict what kind of RTC instances will be at the time of the redeployment process
  - Could it possible to reconfigure a RT-System using a running RTC technically?

RTCInstanceInfo



Issues for discussion

- What kind of information could be used as a search keyword in a directory? Anything else?
  - Id
  - Name
  - Category name
  - Vendor name
  - Version number
  - User defined properties
  - Mobility
  - Location

Issues for discussion

- If a RT-System needs to reconfigure using a running RTC instance, could the information of location and mobility be helpful to search an appropriate RTC instance in a directory?
  - 'Location' means the current location of RTC instance (actually it means the location of a robot which the RTC is running)
  - 'Mobility' means whether the robot which the RTC is running is a mobile robot or not

Robotic Functional Service WG (RoIS Framework)

2011/3/22

Sato (ATR/JARA), Hori(AIST), Chi, Cho(ETRI)

Basic HRI Component Policy

HRI components are abstract functional units making up the description of a human-robot interaction scenario.
Basic HRI components are HRI components that are commonly used to obtain information and to control robot behaviors for the human-robot interaction. Each basic HRI component shall be a functional unit that is developed with mature technologies from the viewpoint of the usage.
Methods for each basic HRI component shall be simple as possible.
Mandatory parameters for the operation of each component shall be minimized. The component can be operated only with the mandatory parameter. If the component can provide additional information or configuration parameter, those parameter may be provided as optional parameter.
The other HRI components may be provided as “user-defined HRI component”.

Definition of HRI Component

•HRI components are functional units making up the description of a human-robot interaction scenario
•HRI Component provides hardware-independent APIs.
•Only symbolic data is exchanged between HRI Components and service applications.
•Symbolic data is used in the service applications without special handling such as pattern recognition, signal processing and human judgment.

- −Service application can obtain information only as the symbolic data through the APIs.
- −Service application can specify instruction using the symbolic data through the APIs.
- −The symbolic data should be directly used for conditional sentences such as IF type statement.
- −The symbolic data should be directly used for specifying action for human-robot interaction.
- −The symbolic data does not include raw data such as image data and sound data collected by sensors.

Basic HRI Component Selection Index

- Simplicity of usage
  A. can be used directly
  B. needs some references (codebook etc.)
  C. needs robot-specific treatment
     or can not express in symbolic data

- Maturity of usage of the technology
  A. is used in other products commonly
  B. has some products (or open sources)
  C. is still under development

Components for Robot Information

~~Self Localization~~

(System Information)

These message are the information about HRI engine.
A HRI engine shall include this component
when the engine can provide these information.

Description: Detects position of physical unit (robot or sensor(s))				
Query				
robot position	returns following results			
result	timestamp	DateTime	M	
result	position of unit	Set<LocationData>[RLS]	M	
engine status	returns following results			
result	status	Component_Status	M	

~~optional~~

operable time:DateTime

Components for Human Information

RoIS Common

Description: common method for all HRI components				
Command				
start	Start the functionality of the HRI component			
stop	Stop the functionality of the HRI component			
suspend	Suspend the functionality of the HRI component			
resume	Resume the functionality of the HRI component			
Query				
status	Obtain status of the HRI component			
result	status	Component_Status	M	

Person Detection

Description: Detects number of people				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
person detected	notifies when number of people has changed			
detail data	timestamp	DateTime	M	
detail data	number of person	Integer	M	

optional

none

Person Localization

divide into ID and reference?
ID:RS_Identifier[ISO19115]
ID_reference：RS_ReferenceSystem[ISO19115]

Description: Detects position of people				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
person localized	notifies when person position is localized			
detail data	timestamp	DateTime	M	
detail data	ID of person	List<ID with reference>	M	RS_ReferenceSystem[ISO19115]
detail data	position of person	List<LocationalData>]	M	

optional

none

ID for detected person and its related reference.
(e.g. If the reference is same as the reference of Person Identification Component, the ID means person identified ID)

Person Identification

Description: Identifies ID (name) of people				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
person identified	notifies when person ID is identified			
detail data	timestamp	DateTime	M	
detail data	ID of person	List<ID with reference>	M	RS_ReferenceSystem [ISO19115]

ID and its related reference

optional

none

Face Detection

Description: Detects number of faces				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
face detected	notifies when number of faces has changed			
detail data	timestamp	DateTime	M	
detail data	number of face	Integer	M	

optional

none

Face Localization

Description: Detects position of face				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
face localized	notifies when face position is localized			
detail data	timestamp	DateTime	M	
detail data	ID of face	List<ID with reference>	M	RS_ReferenceSystem[ISO19115]
detail data	position of face	List<LocationalID RLS]	M	

optional

none

ID for detected face and its related reference.
(e.g. If the reference is same as the reference of Person Identification Component, the ID means person identified ID)

Sound Detection

Description: Detects number of sounds				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
sound detected	notifies when number of sound has changed			
detail data	timestamp	DateTime	M	
detail data	number of sound sources	Integer	M	

optional

none

Sound Localization

Description: Detects position of sound				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
sound localized	notifies when sound position is localized			
detail data	timestamp	DateTime	M	
detail data	ID of sound	List<ID with reference>	M	RS_ReferenceSystem[ISO19115]
detail data	position of sound	List<LocationalData>[RLS]	M	

optional

none

ID for detected face and its related reference.

Speech Recognition

optional

grammar rule

Description: Recognizes person's speech				
Command (In addition to RoIS_Common)				
(RoIS Common)				
Query				
get parameter	gets parameter for speech recognition (each parameter may be set by "set parameter")			
parameter	languages	Set<String>[ISO639-1]	M	
parameter	recognizable lang.	Set<String>[ISO639-1]	M	
Event				
speech recognized	notifies when speech is recognized			
detail data	timestamp	DateTime	M	
detail data	result	List<String> (recommend N-best)	M	
speech input started	notifies when speech input is started			
detail data	timestamp	DateTime	M	
speech input finished	notifies when speech input is finished			
detail data	timestamp	DateTime	M	

Gesture Recognition

Description:				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
get parameter	gets parameter for reaction			
parameter	recognizable gesture	Set<ID with reference>	M	RS_ReferenceSystem[ISO19115]
Event				
gesture recognized	notifies when gesture is recognized			
detail data	timestamp	DateTime	M	
detail data	result	ID with reference	M	RS_ReferenceSystem[ISO19115]

optional

none

Components for Robot Action

Speech Synthesis

Description: Generates robot speech				
Command (In addition to RoIS_Common)				
(RoIS Common)				
set parameter	sets parameter for speech synthesis (each parameter shall be obtained by “get parameter”)			
parameter	plain text	String	C	
	SSML format text	String[W3C-SSML]	C	
Query (In addition to RoIS_Common)				
get parameter	gets parameter for speech synthesis (each parameter may be set by “set parameter”)			
parameter	synthesizable lang.	Set<String>[ISO639-1]	M	
parameter	Synthesizable char.	Set<String>	M	
parameter	volume	Integer	O	
parameter	character	String	O	
Event				
(no event)				

optional

volume
character
speed(Integer)

Reaction (temporary name)

Description: Performs affirmative, negative reaction				
Command (In addition to RoIS_Common)				
set parameter	sets parameter for reaction (each parameter shall be obtained by “get parameter”)			
parameter	reaction type	ID with reference	M	RS_ReferenceSystem[ISO19115]
Query (In addition to RoIS_Common)				
get parameter	gets parameter for reaction			
parameter	usable reaction	Set<ID with reference>	M	RS_ReferenceSystem[ISO19115]
Event				
(no event)				

optional

(under consideration)

Navigation

Description: Moves to specified location				
Command (In addition to RoIS_Common)				
set parameter	sets parameter for navigation (each parameter shall be obtained by “get parameter”)			
parameter	target position	List<LocationalData>[RLS]	M	
Query (In addition to RoIS_Common)				
get parameter	gets parameter for navigation			
Event				
(no event)				

- navigation
  - move to
  - go to
  - going
  - path (tracking)
  - destination
  - trajectory
  - access
  - approach

optional

- time limit
- routing policy

Follow

Description: follows specified target object				
Command (In addition to RoIS_Common)				
set parameter	sets parameter for target tracking (each parameter shall be obtained by “get parameter”)			
parameter	target object	ID with reference	M	RS_ReferenceSystem[ISO19115]
Query (In addition to RoIS_Common)				
get parameter	gets parameter for target tracking			
Event				
(no event)				

optional

- time limit

Move

Description: Moves to specified distance or curve				
Command (In addition to RoIS_Common)				
set parameter	sets parameter for move (each parameter shall be obtained by “get parameter”)			
parameter	distance[mm]	Integer	C	forward/backward
	rotation (radius[mm], degree[degree])	Integer	C	right/left curve
Query (In addition to RoIS_Common)				
get parameter	gets parameter for move			
Event				
(no event)				

optional

none

Should we consider omni-directional robots?

[Example of User-defined Comp.] Person Gender Identification

Description: identifies gender of of people				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
person_gender_identified				
	male or female			

[Example of User-defined Comp.] Person Age Recognition

Description: recognizes age of of people				
Command (In addition to RoIS_Common)				
Query (In addition to RoIS_Common)				
Event				
person_age_recognized				
	lower limit	Integer		
	upper limit	Integer		

Annex: Speech Recognition (W3C-SRGS)

Description: Recognizes person's speech (with a descriptive grammar (W3C-SRGS))				
Command (not include the same command in the previous slide)				
set parameter	sets parameter for speech recognition (each parameter shall be obtained by "get parameter")			
parameter	grammar	[W3C-anyURI]	M	
parameter	active rule	[W3C-SRGS]	M	
Query (not include settable parameter in the following list)				
get parameter	gets parameter for speech recognition (each parameter may be set by "get parameter")			
parameter	languages	Set<String>[ISO639-1]	M	
parameter	recognizable lang.	Set<String>[ISO639-1]	M	
Event				
speech recognized	notifies when speech is recognized			
detail data	timestamp	DateTime	M	
detail data	result	*NBestType	M	
input started	notifies when speech input is started			
input finished	notifies when speech input is finished			
recognition started	notifies when recognition is started			
recognition finished	notifies when recognition is finished			

Procedure for command messages

- Sequential operation

  →is available by permitting loop of execute() in the command sequence

- Parallel operation

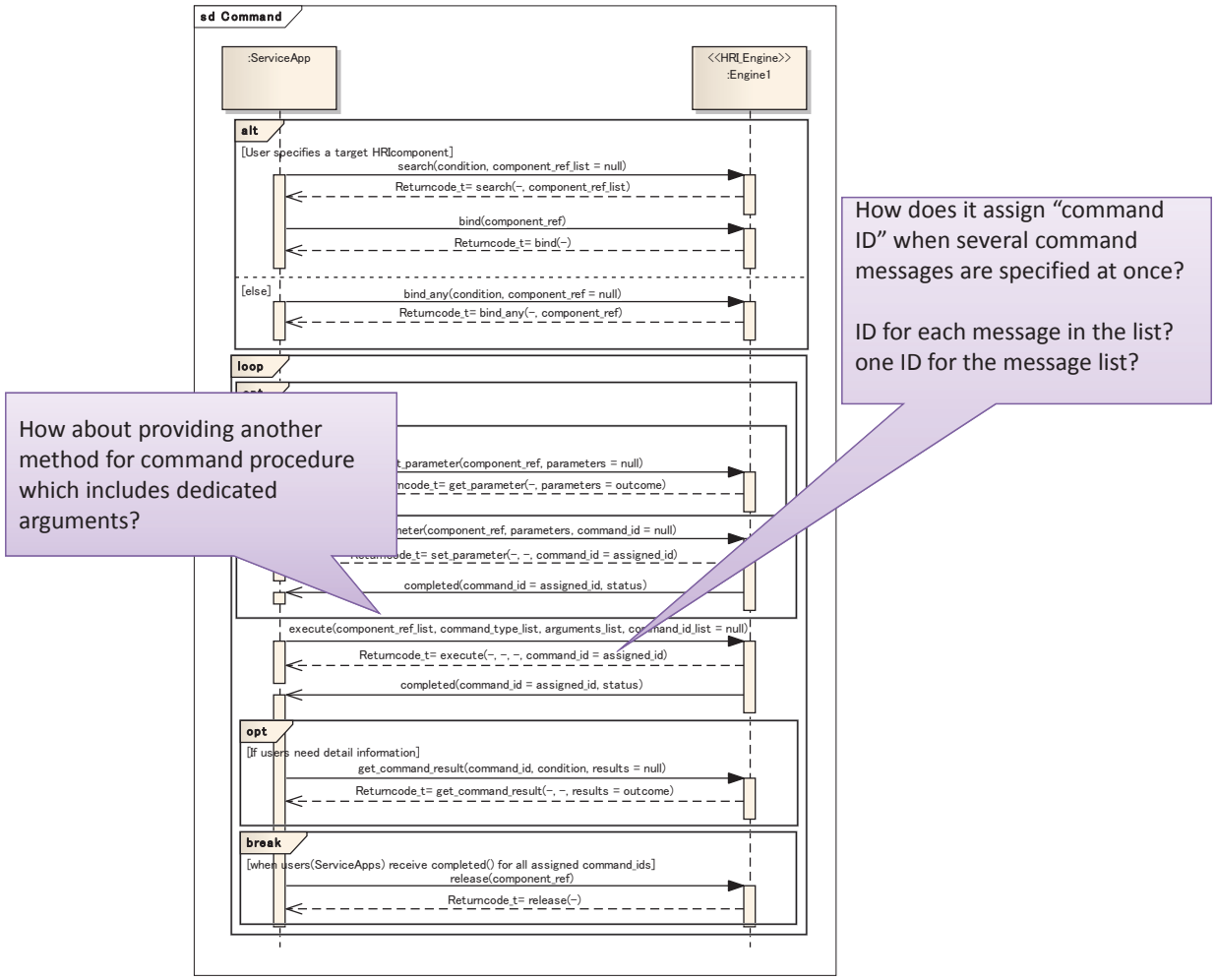
  →is available by defining a relationship with parallel-executable messages in the message profile.

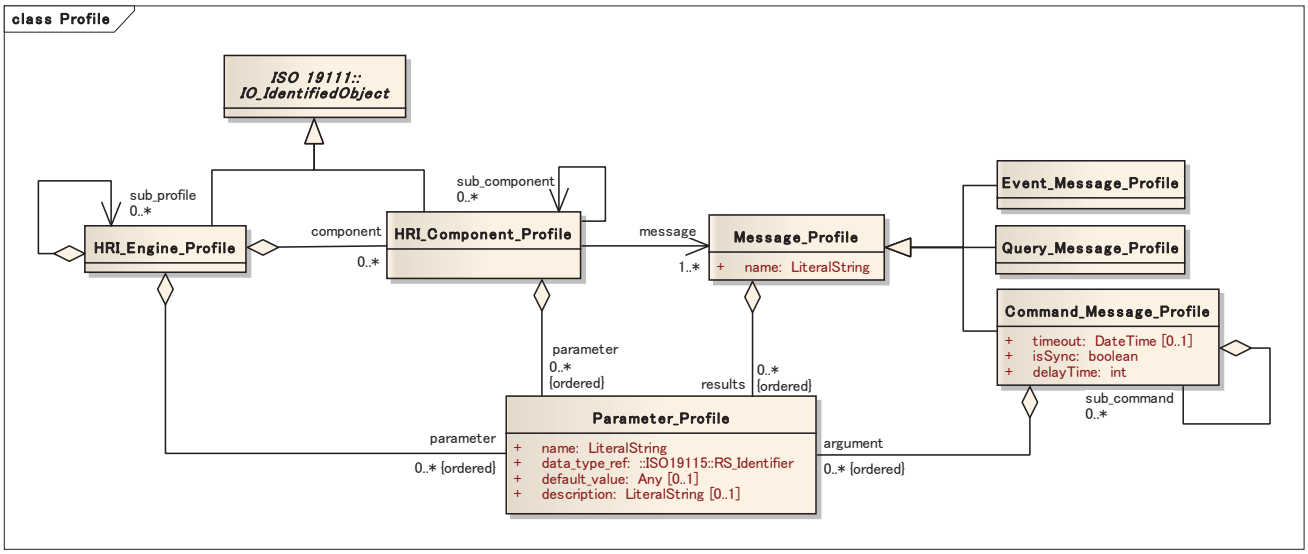
We need to consider how to handle arguments of execute()

```
execute(
        component_ref,
        command_type,
        arguments,
        command_id=null
        )
```

?

```
execute(
        List<component_ref>,
        List<command_type>,
        List< arguments>,
        List<command_id=nul
l>
        )
```




class Profile
ISO 19111::
IO_IdentifiedObject
sub_profile
0..*
sub_component
0..*
HRI_Engine_Profile
component
0..*
HRI_Component_Profile
message
1..*
Message_Profile
+ name: LiteralString
Event_Message_Profile
Query_Message_Profile
Command_Message_Profile
+ timeout: DateTime [0..1]
+ isSync: boolean
+ delayTime: int
sub_command
0..*
parameter
0..*
{ordered}
results
0..*
{ordered}
Parameter_Profile
+ name: LiteralString
+ data_type_ref: ::ISO19115::RS_Identifier
+ default_value: Any [0..1]
+ description: LiteralString [0..1]
parameter
0..* {ordered}
argument
0..* {ordered}

Proteus

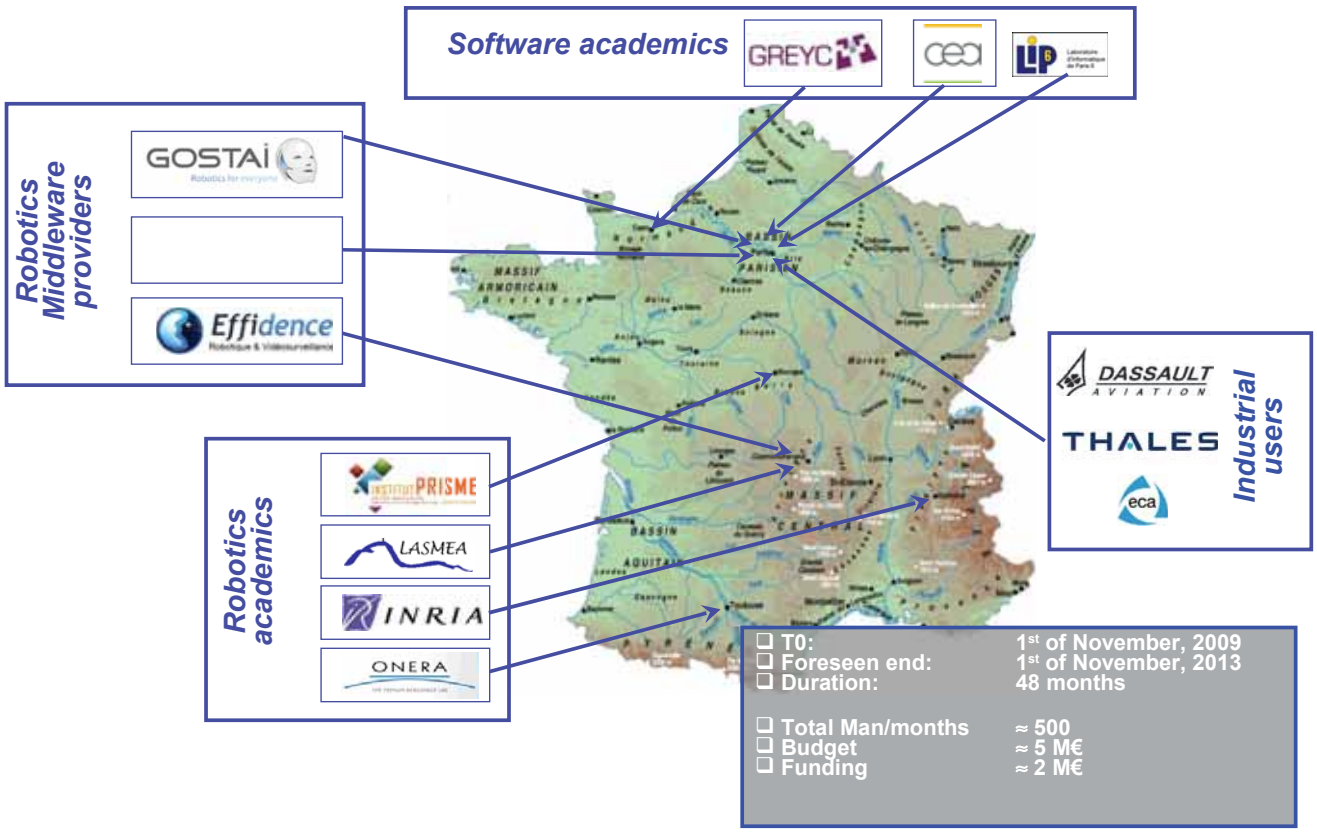
A French national initiative

Platform for **RO**botic modeling and
Transformations for **E**nd-**U**sers and **S**cientific communities

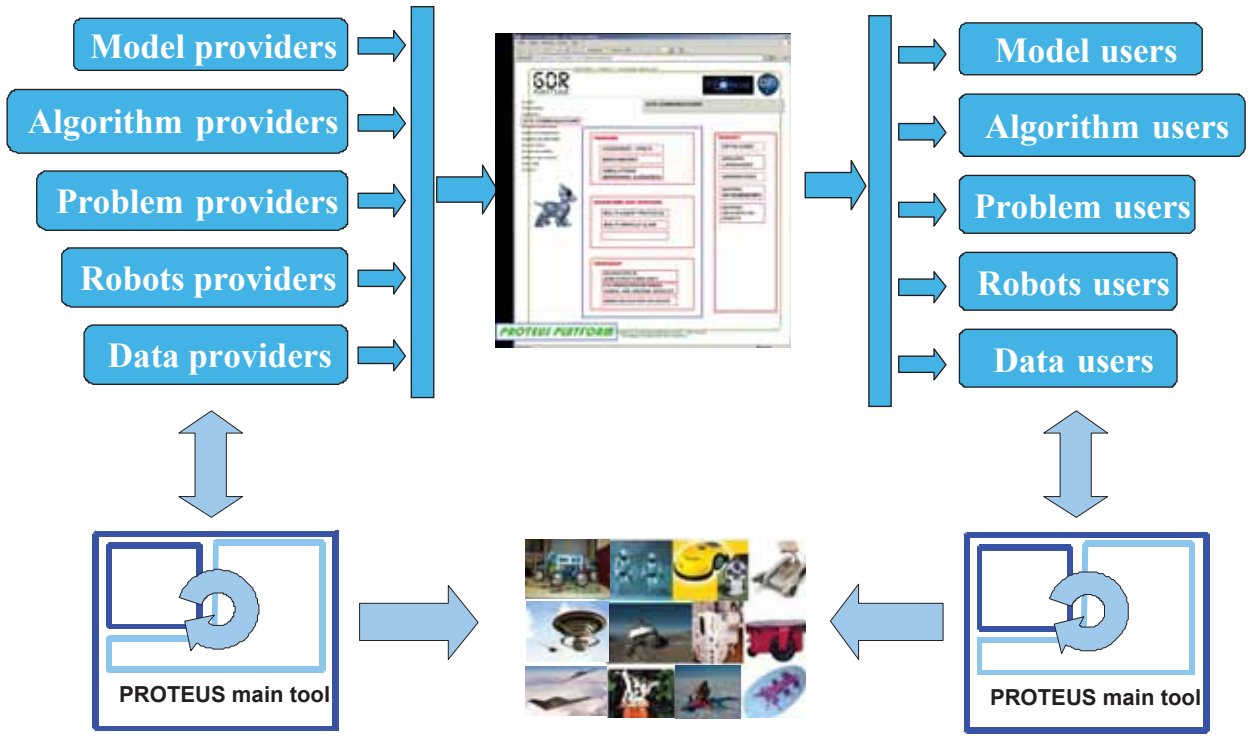
AGENDA

- **PROTEUS PROJECT ORGANISATION**
- PROTEUS CHALLENGES & SCENARIOS
- PROTEUS ONTOLOGY
- PROTEUS TOOLS ARCHITECTURE
- DISSEMINATIONS ACTIVITIES

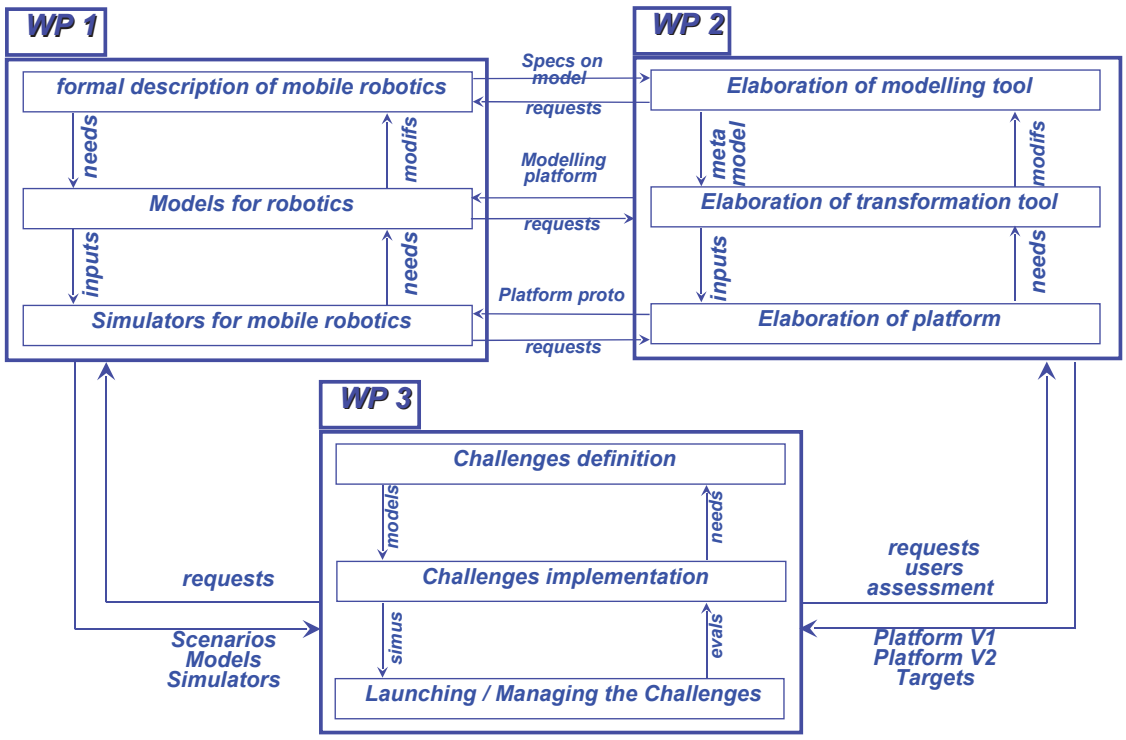
PROTEUS - THE "WHO"



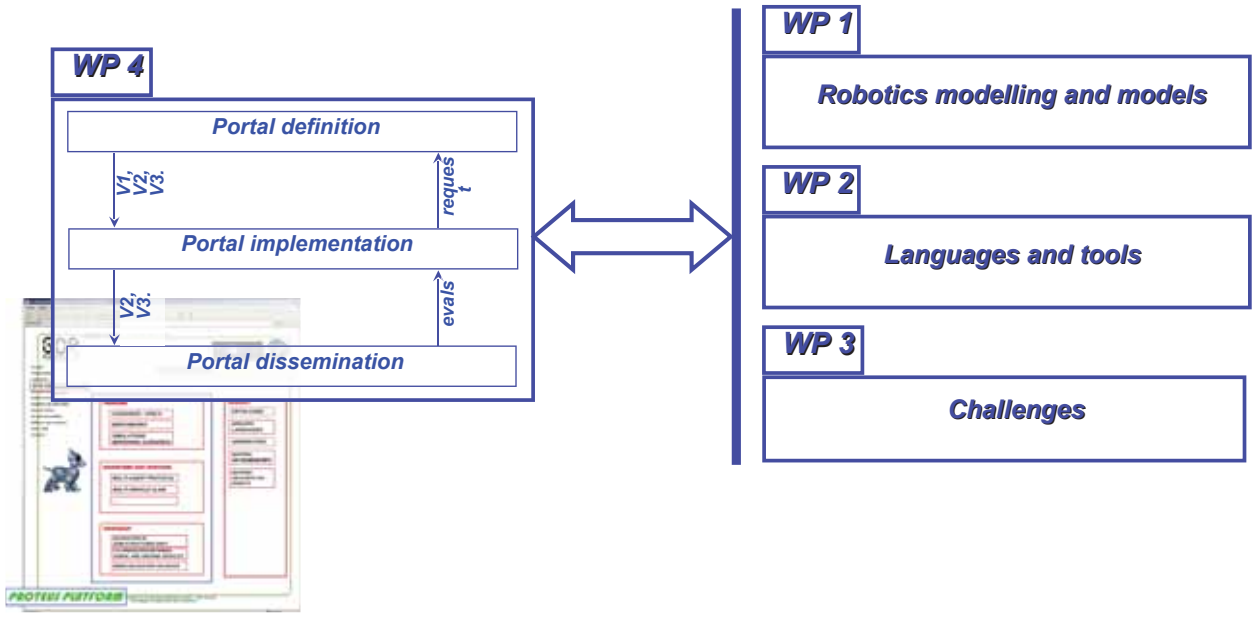
PROTEUS - THE "WHAT"



PROTEUS - THE "HOW"

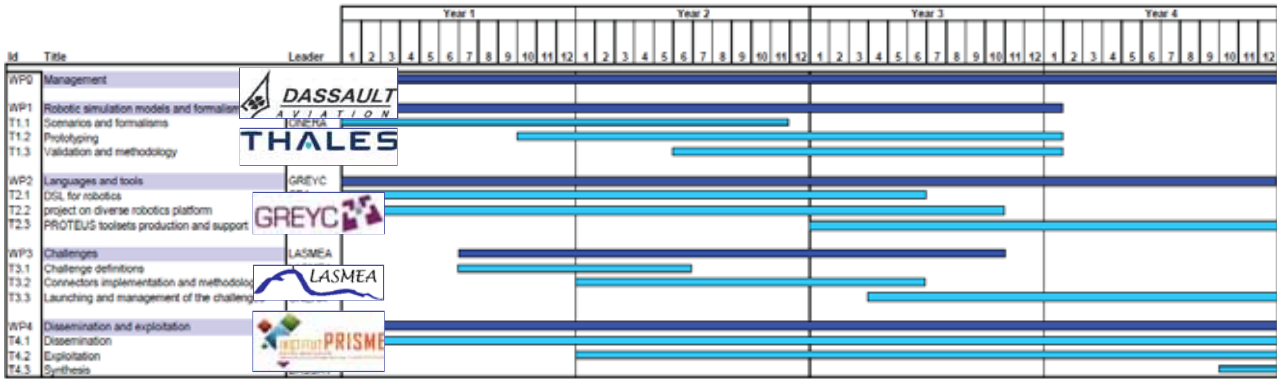


PROTEUS - THE "HOW"



PROTEUS - THE "WHEN"

T_{start}: 1st of November, 2009



T_{end}: 1st of December, 2013

AGENDA

- PROTEUS PROJECT ORGANISATION
- **PROTEUS CHALLENGES & SCENARIOS**
- PROTEUS ONTOLOGY
- PROTEUS TOOLS ARCHITECTUREDISSEMINATIONS ACTIVITIES

PROTEUS Challenges Launching

- 4 challenges :
  - Challenge 1 : Urban Challenge
  - Challenge 2 : Aero-Terrestrial Challenge
  - Challenge 3 : Indoor Challenge
  - Challenge 4 : Young Challenge
- General Challenge schedule :
  - Step1 : Challenger registeration. (Beginning of year 2012)
  - Step 2 : Challenger selection
    - Under the simulated environment.
    - Winter 2012.
  - Step 3 : Final Event
    - On-site and using the provided robotic plateform.
    - Summer 2013.

Urban challenge : Autonomous navigation in urban area

- Research focus :
  - Motion Planning
  - Localization
  - Control
  - Obstacle detection and tracking

- Organizer : ***LASMEA***
- Demonstrator : ***VIPALAB***
- Test site : ***PAVIN platform***
- Contact :
  - proteus@lasmea.univ-bpclermont.fr

Experimental site and robot description

Experimental site PAVIN: Cezeaux campus, Aubière 63177

Surface : 5000 m², Street: 350 m, ground track: 230 m, Specific Buildings,

- **Urban area (Crossing with traffic light, painted walls)**
- **Open Area**

Experimental site and robot description

Site PAVIN characteristics :

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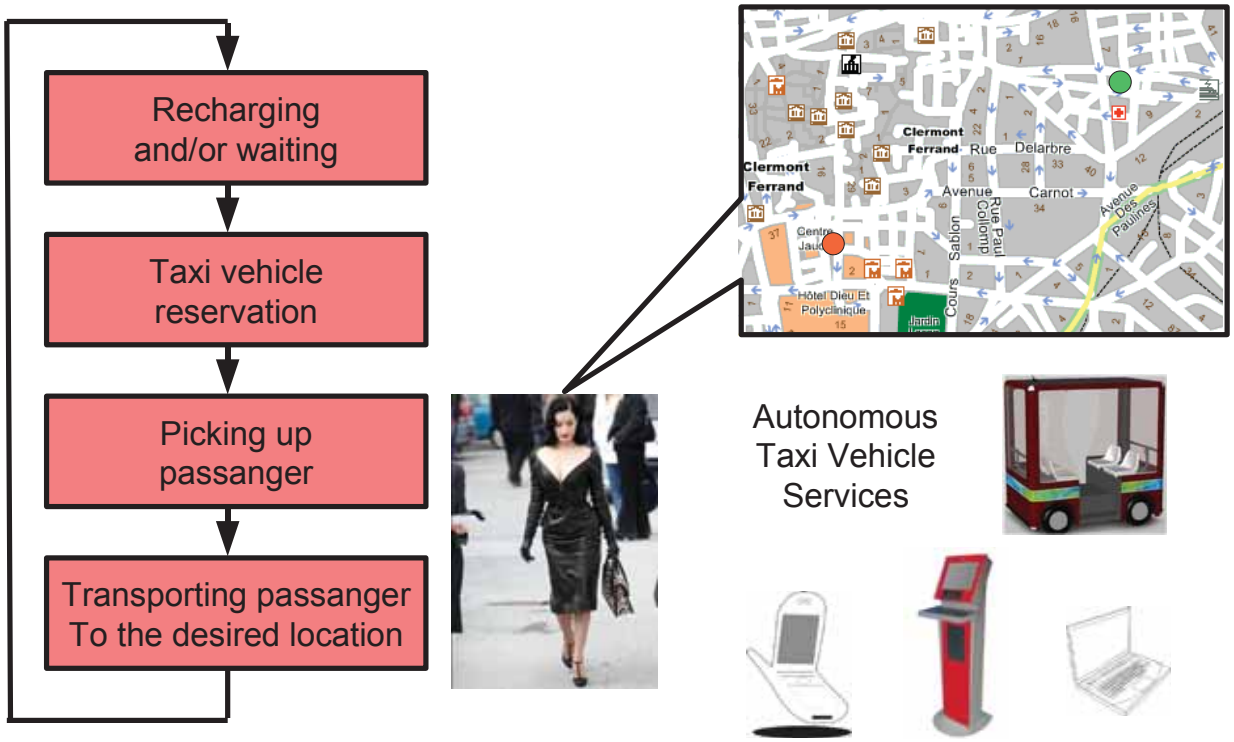
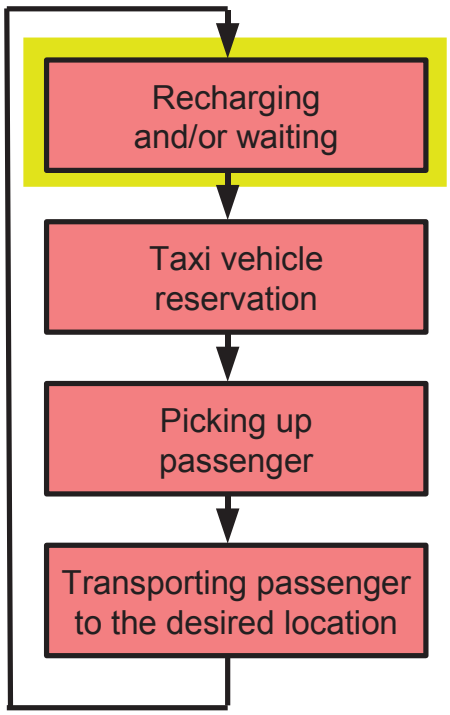
Experimental site and robot description

General scenario



General scenario

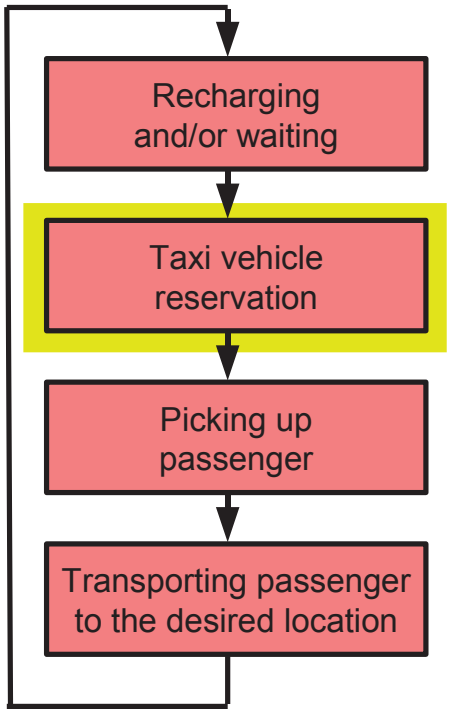


Trajectory planning to join the closest station for recharging and/or waiting

Joining the closest station: trajectory following in dynamic environment (avoiding obstacles, re-planning...)

Docking to the station

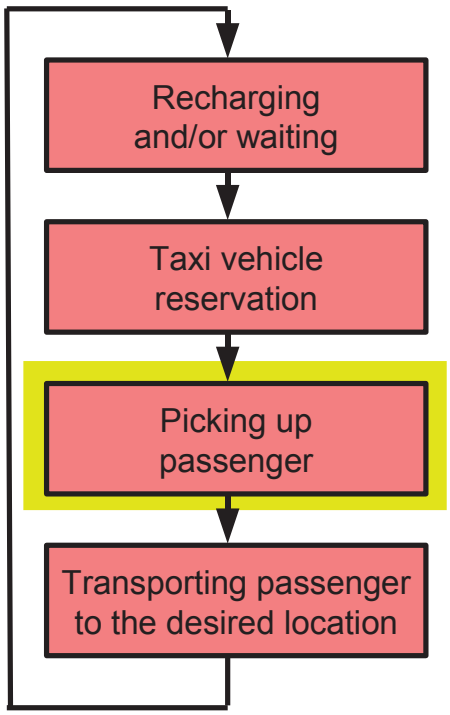
General scenario



Collecting reservation demand and provided information (number of passengers, picking up point, ...)

Accepting or refusing the reservation

General scenario

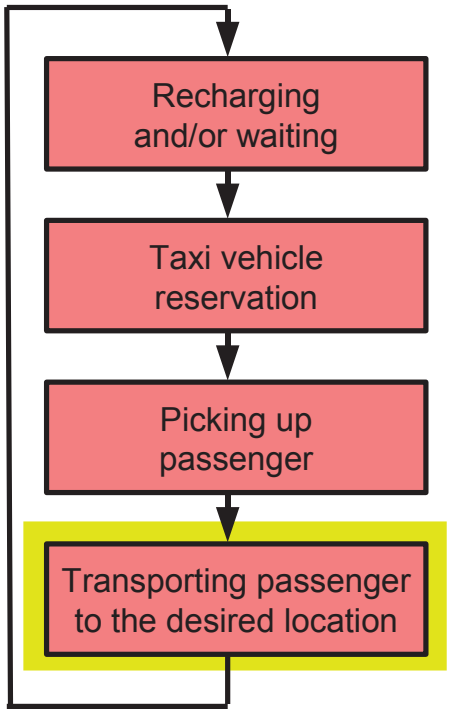


Trajectory planning to join the picking up point

Joining the picking up point: trajectory following in dynamic environment (avoiding obstacles, re-planning...)

Picking up passengers and goal of the reservation (desired location, touristic attraction, historical center, ...)

General scenario



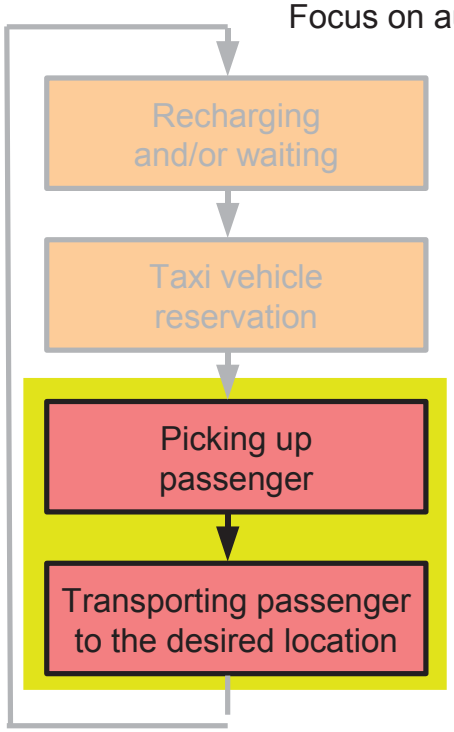
Trajectory planning to join the desired point(s)

Joining the desired point(s): trajectory following in dynamic environment (avoiding obstacles, re-planning...)

Passengers leaving, providing invoice

Challenge scenario

Focus on autonomous navigation problems



Trajectory planning to join the picking up point

Joining the picking up point: trajectory following in dynamic environment (avoiding obstacles, re-planning...)

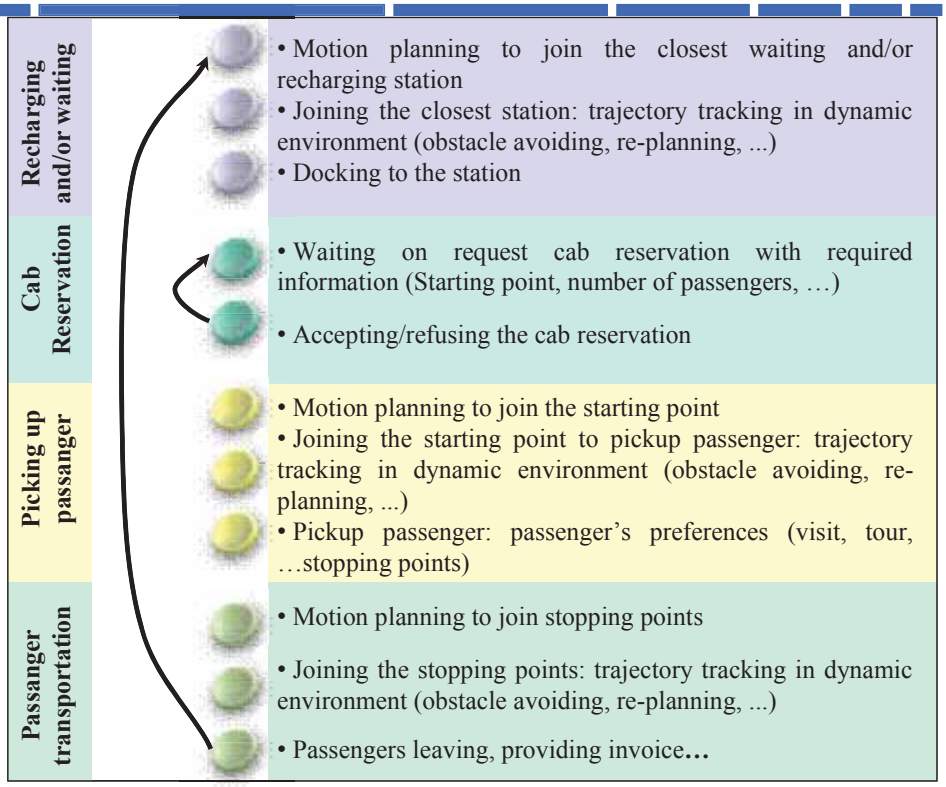
Picking up passengers and goal of the reservation (desired location, touristic attraction, historical center, ...)

Trajectory planning to join the desired point(s)

Joining the desired point(s): trajectory following in dynamic environment (avoiding obstacles, re-planning...)

Passengers leaving, providing invoice

General scenario



Urban challenge : Autonomous navigation in urban area

PROTEUS
Urban Challenge
2012-2013
LASMEA Laboratory
GRAVIR

Aero-Terrestrial challenge Collaborative perception

- Research focus :
  -
- Organizer: ***THALES*** / ***ONERA***
- Demonstrator:
  - ReSSac (UAV)
  - Rtrooper (UGV)
- Test site : ***Caylus***
- Contact :
  - Christine.gal@fr.thalesgroup.com
  - Jean-loup.farges@onera.fr

Challenge : ReSSAC: Main Characteristics

Drone helicopter Yamaha RMAX

- Dimensions : L = 3,7 m l = 0,6 m h = 1,1 m
- Diameter rotors : Main = 3,0 m Back = 0,5 m
- Mass : Empty = 63 kg Payload = 31 kg with 15 experimention
- Maximal automomy = 60 minutes
- Engine: Gasoline

Experimental Conditions

⇨ **Weather**
- Ground Temperature : [8,40] degree
- Humidity : no frog, no rain
- Vent : [0, 50] km/h

⇨ **Seen by the security pilot**
- Distance : [10, 300] m

⇨ **Team management of the helicopter:**
1. Security pilot
2. Flight control leader
3. Internal operator

ONERA

Challenge: R-Trooper – Main characteristics

AUTONOMOUS CAPABILITIES

Security functions
- Automatic speed adjustment to steering radius
- Obstacle detection

Assisted teleoperation
- Teledriving: continuous speed and steering control
- Telepiloting: max. speed and heading control
- Téléguidance: way points and trajectory following

Autonomous behaviors
- Autonomous navigation and obstacle avoidance
- Road and track following
- Leader-follower function
- Trajectory recording and replay

Scalable autonomy
- Man-system workshare according :
  - operator's wish
  - mission complexity
  - technical state of the art
- Extensive range of capabilities by adding new autonomous behaviors

MAIN FEATURES

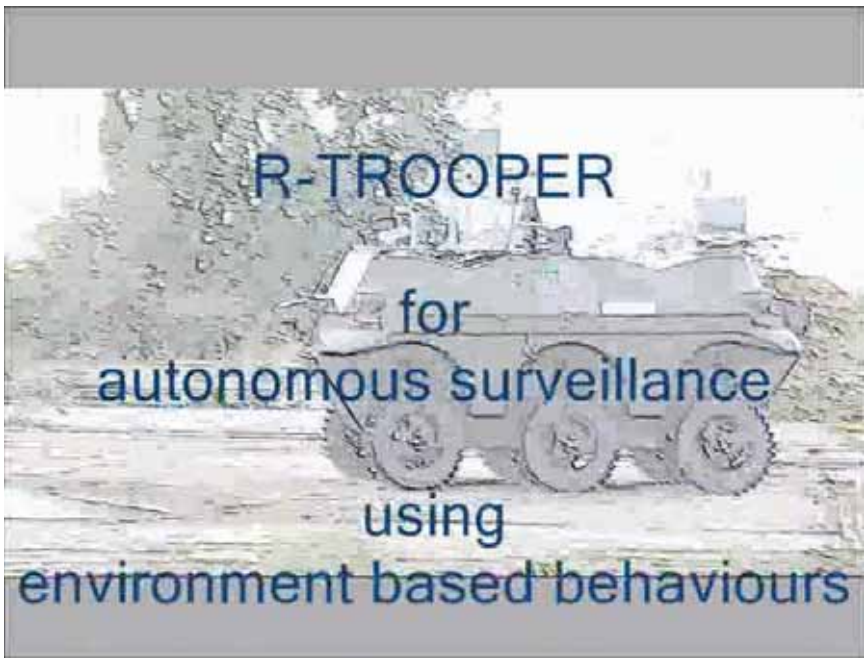
Dimensions
- L x W x H: 2.80 x 1.60 x 1.35 m
- Ground clearance: 0.2 m
- Total weight: 800 kg

Mobility
- Symmetrical movement (frontward / backward)
- Maximum speed: > 50 km/h
- Radius of curvature:
  - Less than 0.9 m using steering wheels mode
  - 0 m (swivel) using differential speed mode
- Slope / roll: > 30°/ 45°
- Steps: > 0.2 m
- Mission duration:
  - > 8 hours in thermal mode
  - > 20 mn every 2 hours in fully electrical mode

Payload
- Maximum weight: 250 kg
- Energy (from platform):
  - 1 kW continuous
  - > 4 hours with engine stopped
- Marsupial capabilities:
  - 2 micro-robots on-board (PACKBOT, µ-TROOPER)
  - Coupled to R-TROOPER control system
- Working range (radio): 2 - 5 km

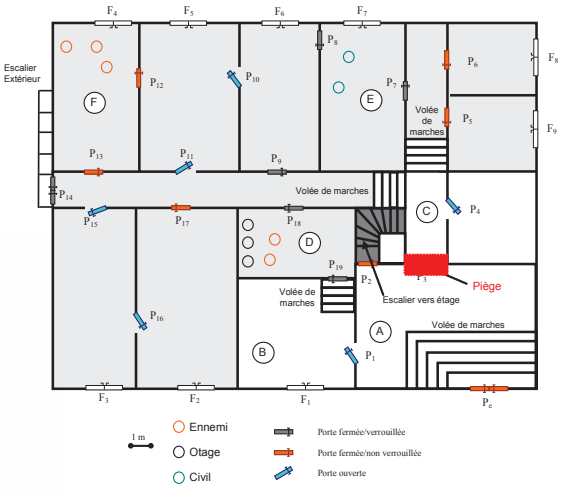
THALES

Aero-Terrestrial challenge
Collaborative perception



Indoor challenge

- Research focus :
  - Autonomous stairs evolution
- Organizer: ***ECA***
- Demonstrator: CAMELEON
- Site : Not yet defined
- Contact :
  - sd@eca.fr



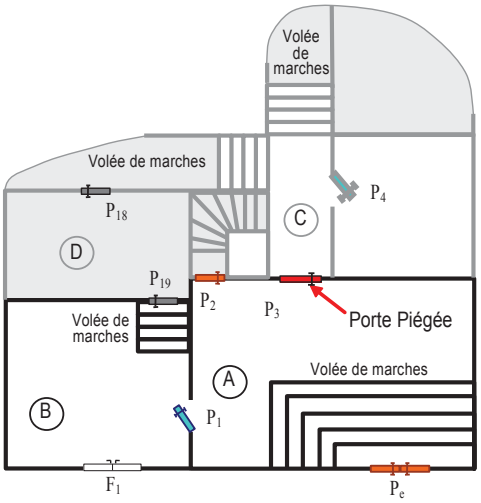
Robot in the Stairs: SCENARIO

Mission **Building re-construction**

Room identification during progress

The robot can be manipulated by someone.

Scenario described by basics actions:



Put at Pe (Exterior) .

Take over Pe.

Orientation and observation room A

Order Réception to progress in room A.

Progress in A and in the stair

Collecting representative Data of room A

Construction and information about a MAP of the room A

Order réception to Door P_1.

Progress to P_1, P_1 open.

progress

Etc ....

Indoor challenge

Young challenge
Robotic challenge dedicated to students

- Research Focus
  - Obstacle detection and avoidance
  - Mapping
  - Visual recognition
  - Multi-robot cooperation
- Specific duration and schedule :
  - 1 academic year
- Organizer : ***PRISME***
- Demonstrator : ***WIFIBOT***
- Site : ***DGA – Bourges***
- Contact :
  - Cyril.novales@bourges.univ-orleans.fr

- RYC scenario
- Functional architecture
- Challenge presentation
- Experimental site and robot description
- **Hardware and software architecture**
- Challenge schedule
- Simulation and validation : available data
- Metrics and organization
- State of the art
- Potential challengers

Harware and software architecture

- PC
  - dual core 2GHz
  - 2GB Memory
  - SSID HD
  - Wifi, Usb, Firewire
  -
- OS (embedded) : **linux** (Ubuntu) or ~~Windows (XP)~~.

- Middleware (choice / challenger) :
  - RTMaps (Intempora)
  - Urbi (Gostaï)
  - Aroc@m (Effidence)
  - Orocos ??

Challenge Description

3 events/competitions :

- Event 1 : Explore and Find

- Event 2 : Explore, Find and Come-back

- Event 3 : Explore, Share/Organise, Find and Come-back

Each event have a time limit of 30minutes,

Challengers have a time-slot of 1 hour, and can use this time to neutralise and to try again the event. Each try-again cancel the previous try.

RYC - Event 1: Explore & Find

Goal : Find and position the robot at less than 5m of a landmark, and take a picture of it. (30mn)

The Challenger inputs :

. a Symbolic description of the landmark to find & a photo in situ,

. a 10x10m^2 area whereis the landmark,

. a blank map with the surround, the in/out area and few obstacles,

. the types of data to transmit,

. media and protocol for transmission.

RYC - Event 1: Explore & Find

Begin :

. Challenger put the robot in the input/output area. Run => t=0

During the event :

. the robot must find the landmark, avoiding obstacle, in a minimal time,

. a computer monitor the robot (/wifi) without any action : it records and print all the variable wanted by the challenger (including the map), receive and print the messages comming from the robot

. a emmergency stop (/wifi) is needed

. no more communication allowed

End :

. the chonometer is stopped when the robot find the landmark, stop at less than 5m, send « mission terminated » message and a photo of the landmark, in a time less than 30 minutes

No Bonus in event 1

RYC - Event 2: Explore, Find & Come-Back

Goal : Take a picture of a landmark, position it in the map with an error smaller than 10m, and go back to the input area in a time smaller than 30 minutes.

The Challenger inputs :

. a Symbolic description of the landmark to find,

. a blank map with the surround, the in/out area and few obstacles,

. the types of data to transmit,

. media and protocol for transmission.

RYC - Event 2: Explore, Find & Come-Back

Begin :

. Challenger put the robot in the input/output area. Run => t=0

During the event :

. the robot must find the landmark, avoiding obstacle, in a minimal time,

. a computer monitor the robot (/wifi) without any action : it records and print all the data wanted by the challenger (including the map), receive and print the messages comming from the robot

. a emmergency stop (/wifi) is needed. no more communication allowed

. the robot builts a online map and places identified encoutered landmark

. the robot count mobile obstacles that it encounters

End :

. the chonometer is stopped when the robot come back in the in/out area, in a time less than 30 minutes.

Bonus 1 : online map building

- Bonus 2 : count of mobile obstacles encountered

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RYC - Event 3: Explore, Find, Share & Come-Back

Begin :

. Challengers put the *2* robots in the input/output area. Run => t=0

During the event :

. the robot must find the landmark, avoiding obstacle, in a minimal time,

. a computer monitor the robot (/wifi) without any action : it records and print all the data wanted by the challenger (including the map), receive and print the messages comming from the robot

. a emmergency stop (/wifi) is needed.

. the robot can exchange data (/wifi).

. the robot builts a online map and places identified encoutered landmark

. the robot count mobile obstacles that it encounters

End :

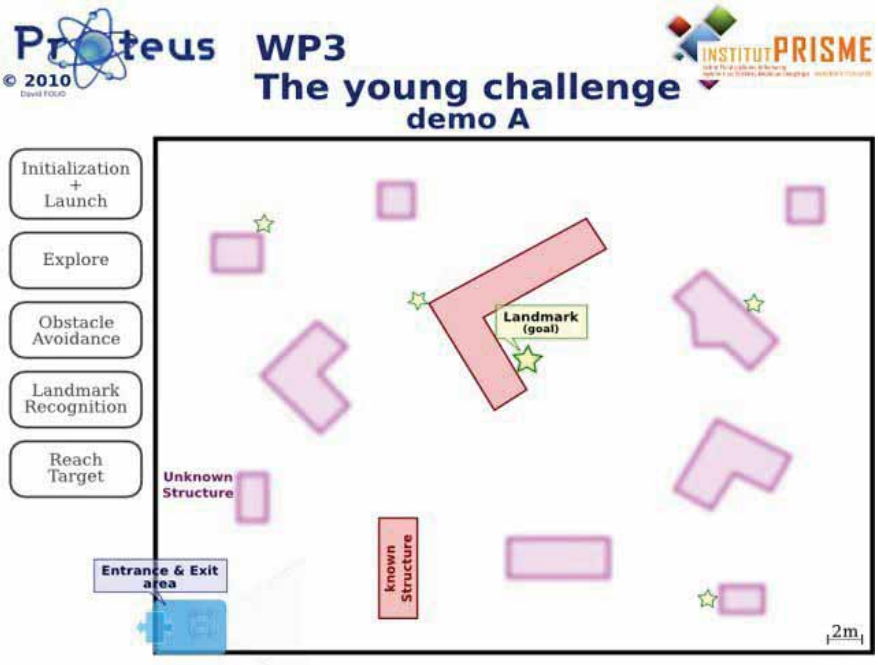
. the chonometer is stopped when the *last* robot come back in the in/out area, in a time less than 30 minutes.

Bonus 1 : online map building

Bonus 3 : Multi-robot data share

- Bonus 2 : count of mobile obstacles encountered

Young challenge
Robotic challenge dedicated to students



AGENDA

- PROTEUS PROJECT ORGANISATION
- PROTEUS CHALLENGES & SCENARIOS
- **PROTEUS ONTOLOGY**
- PROTEUS TOOLS ARCHITECTURE
- DISSEMINATIONS ACTIVITIES

PROTEUS Robotics Ontology

- Scenarios and formalisms
  - State of the art, Robotics ontology and generic ontology

  Specification of scenarios

  Define robotics Ontology

- Prototyping Scenario
  - Model « functional » level to « hardware » level for each robotics challenge
  - High Level (functional) to very low level (hardware)
  - Elaborate simulation models for each challenge.

- Validation and Methodology

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AGENDA

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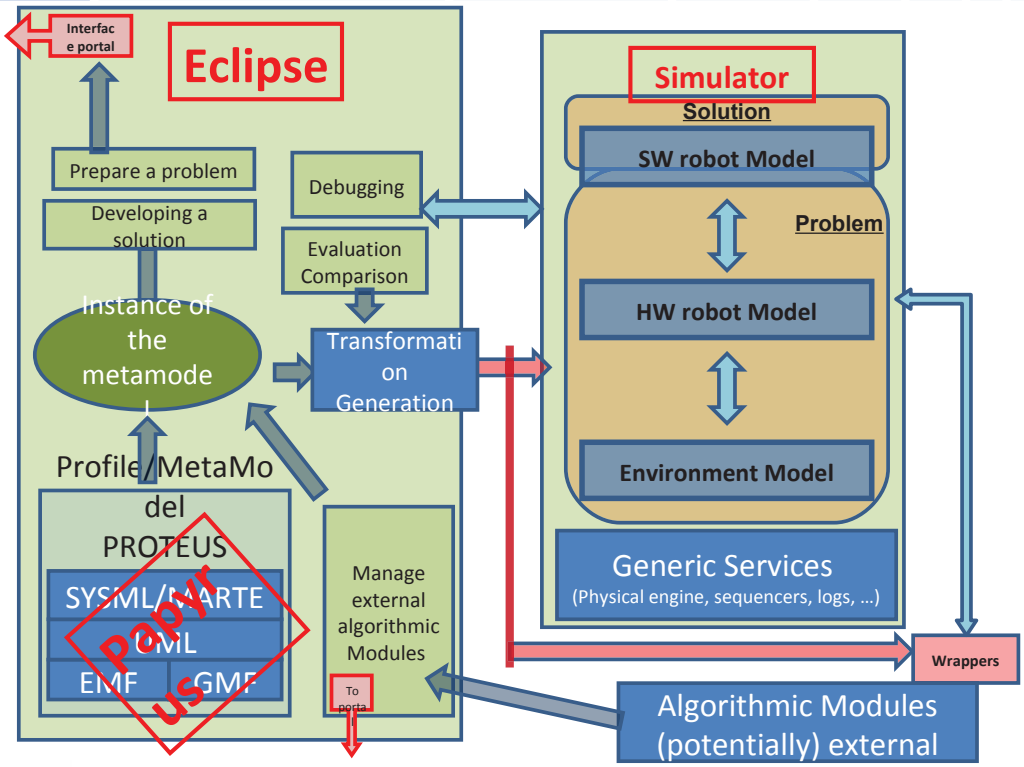
- PROTEUS ONTOLOGY
- **PROTEUS TOOLS ARCHITECTURE**
- DISSEMINATIONS ACTIVITIES

Tools and simulators architecture



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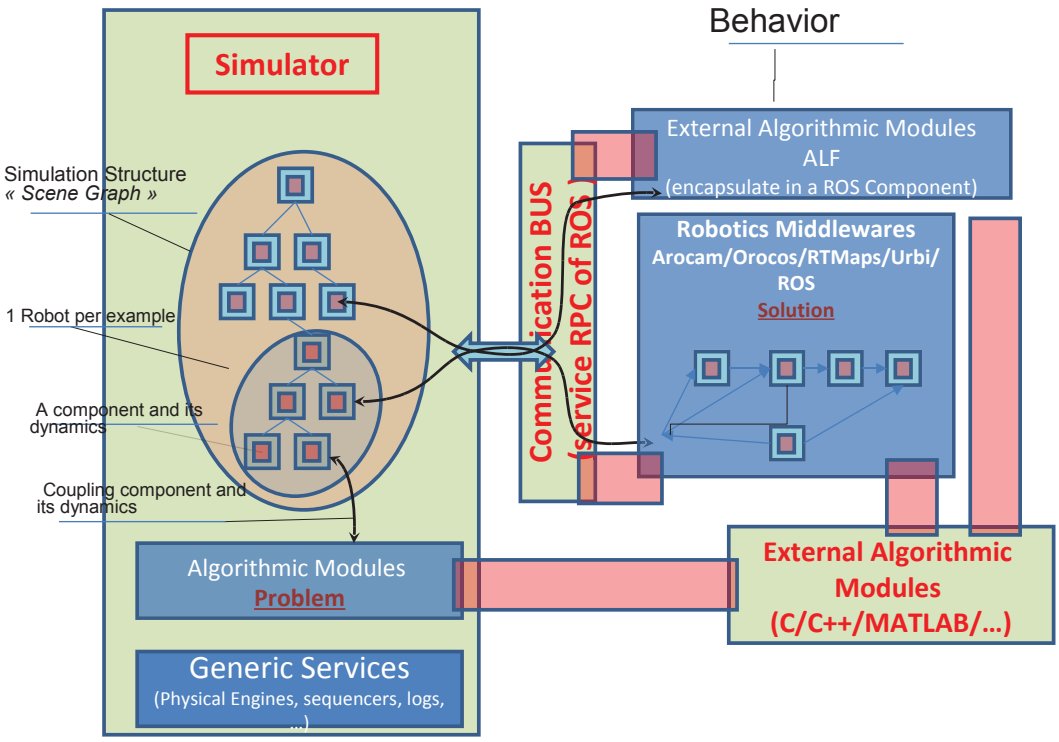
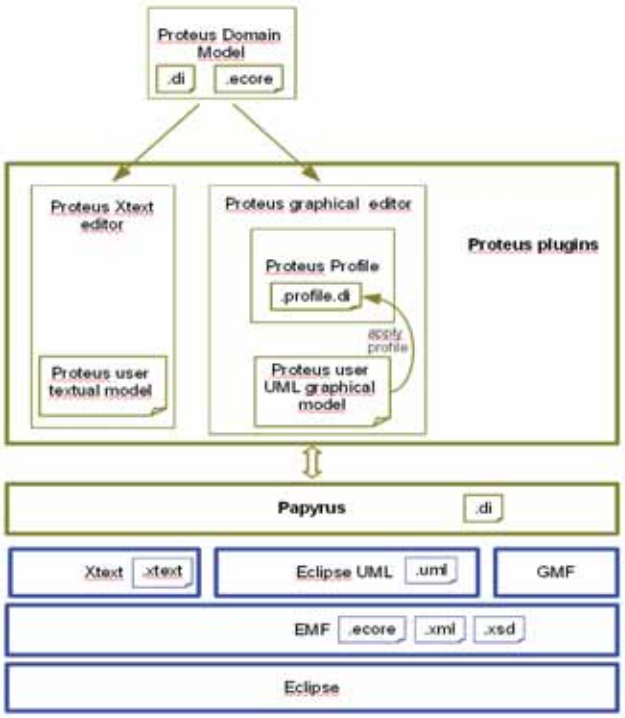
simulators architecture



Modeling Tools Architecture



AGENDA

- PROTEUS PROJECT ORGANISATION
- PROTEUS CHALLENGES & SCENARIOS
- PROTEUS ONTOLOGY
- PROTEUS TOOLS ARCHITECTURE
- **DISSEMINATIONS ACTIVITIES**

DISSEMINATION

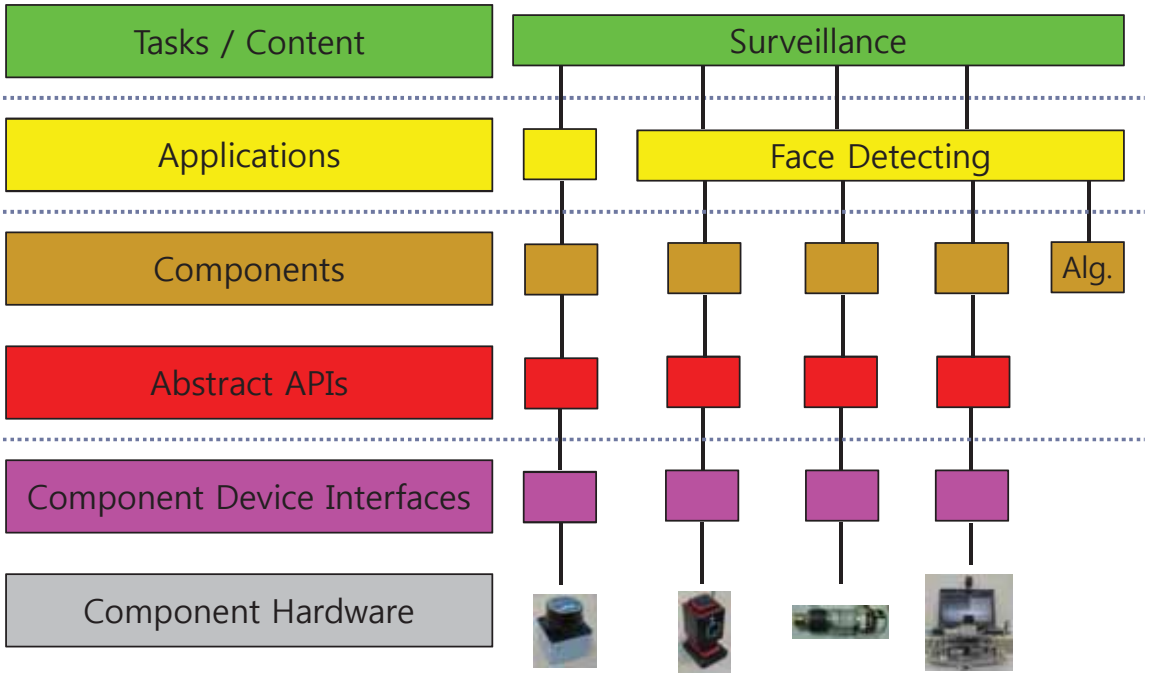
- ROSYM'10: Workshop in conjunction with MODELS conference
  - 1st international workshop on Model Based Engineering for Robotics
  - http://www.artist-embedded.org/artist/RoSym-2010,2158.html
- DSLROB'10: in conjunction with IROS, October 2010
  - 1st International Workshop on Domain-Specific Languages and models for ROBotic systems (DSLRob'10),
  - http://www.doesnotunderstand.org/wikka.php?wakka=DSLRob10
- Strong links with EUROP and EURON
- EU Robotics forum - 6-8 /04/2011 - Västeras - Sweden
  - Presentation: French PROTEUS Platform

Conformance Testing Method for Robot Software Components

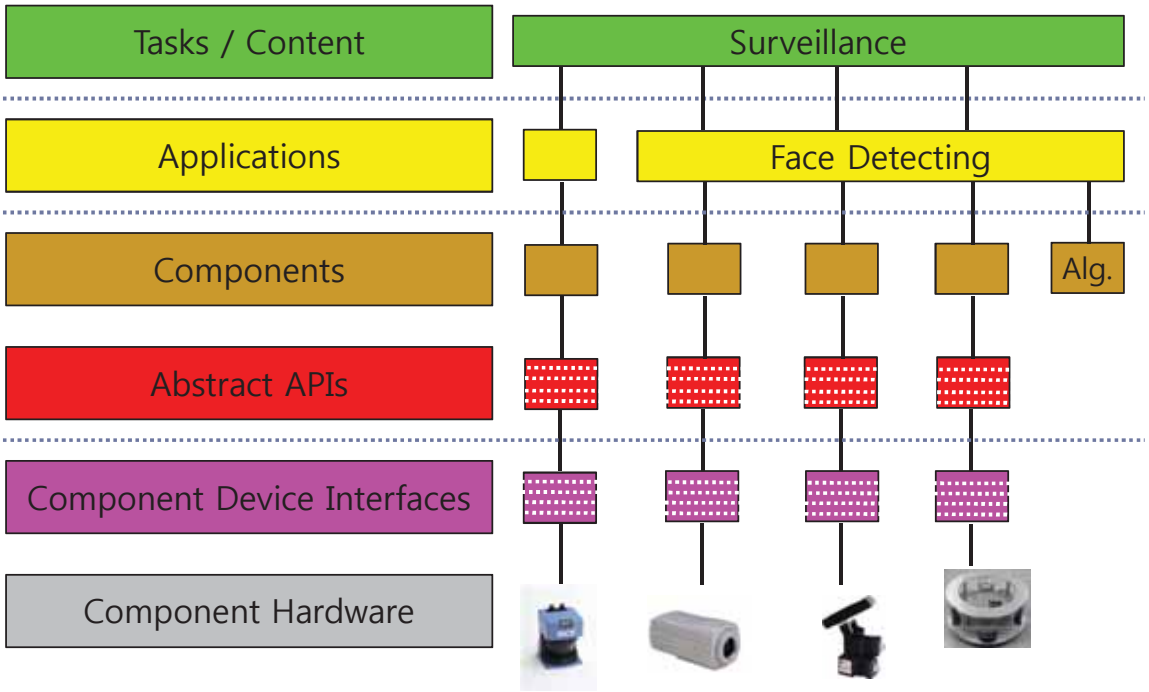
Kangwon National University Robot S/W Research Center
Hong Seong Park, and Mi-Sook Kim 2010.03.24

Contents

Robot Software Component



Robot Software Component



Testing Component

- If the components are
  - Written in abnormal ways or
  - differ from defined component specifications,
  - it is difficult to achieve a normal robot application
- Verification is required to check
  - if the robot software component follows the standard

Objectives

- Defining conformance testing items for Robot SW Components
  - Structural conformance items
  - Dynamic conformance items
- Standards for defining evaluation systems and procedural documents of the test
  - Constituents of the evaluation system for testing Robot SW Components
  - Defining procedures for testing items
  - Format for testing results

Testing items

Test Classification	Test details
Structural Conformance	▸Verification whether the component profile follows the standard or not ▸Verification of consistency between component profile and source code ▸Verification of essential item implementation within the source code
Dynamic Conformance	▸Verification of basic operation of the component ▸Verification of state transition of the component ▸Verification of the interface of the component

Structural Conformance Test Procedure

	Test procedures	Note
1)	Test target materials, robot component standard document and structural conformance test tool are installed at specified environment	
2)	Checks if necessary information is prepared for standard conformance test. 2.1) Check if there is a component library file. 2.2) Check if there is a component profile. 2.3) Check if there is a source code.	
3)	Check the essential items of component related profile. 3.1) Check if all essential items of component profile are stated. (Refer to the component standard) 3.2) For the case that service port profile exists, check if all essential items of profile are described. (Refer to the component standard) 3.3) For the case that data port profile exists, check if all essential items of profile are described. (Refer to the component standard)	
4)	Check on the limiting cardinality for each item of component related profile. 4.1) Check if each item described at component profile follows the limiting cardinality standard. (Refer to the component standard) 4.2) In case of service port profile existence, check if each item described at profile is following the limiting cardinality standard. (Refer to the component standard.) 4.3) In case of data port profile existence, check if each item described at profile is following the limiting cardinality standard. (Refer to the component standard)	
5)	Check the consistency between component items for the described port standard. 5.1) Check related files to see they satisfy the consistency test conditions between component items. (Refer to the component standard.)	

Dynamic Conformance Test Procedure

	Test procedures	Note
1)	Prepare for the dynamic conformance test. 1.1) Prepare the port standard profile, dynamic conformance test tool and component executing middleware. 1.2) Create a test component to test the target component.	
2)	Check if the target component is executed using the component executing middleware.	
3)	Check the compatibility with component executing middleware. 3.1) Check if onInitialize() callback function is called at the time of the initialization of the target component. 3.2) Check if onStart() callback function is called at the time of the start of the target component. 3.3) Check if onExecute() callback function is called according to the period specified on component profile in case that the target component is a periodic component. 3.4) Check if onPeriodChanged() callback function is called when the period is changed in case that the target component is a periodic component. 3.5) Check if onExecute() callback function is called only once in case the target component is a non-periodic component.. 3.6) Check if onStop() callback function is called when the target component is stopped during the process. 3.7) Check if onStart() callback function is called when the target component is restarted after it's been stopped. 3.8) Check if onError() callback function is called when error occurred during the target component process. 3.9) Check if onRecover() callback function is called when it is recovered from the error after the error has occurred. 3.10) Check if onReset(), onInitialize(), onStart() callback functions are called continuously at the time of reset of target component. 3.11) Check if onDestroy() callback function is called at the time of target component termination.	
4)	Test on the basic state transition of the component. 4.1) Execute the target component using the component executing engine. 4.2) By applying the state testing value, check if the state of target component is transit according to the component standard. (Refer to the component standard)	
5)	Verify on the port standard.	

Test Documents

Test documents	Details
Test request documents	▸Application form to request the component conformance test ▸Information on person who requests and component are given. ▸Refer to the Appendix II for this test request document
Test procedure document	▸Test items and procedures for component conformance test ▸Refer to the part 6 for the test procedures
Test result document	▸Results of the component standard conformance test ▸Refer to the Appendix III for the test result document form

Conclusion

- Verification is required to check
  - if the robot software component follow the standard
- Testing categories can be structural conformance and dynamic conformance
- Testing procedures for each conformance tests
- Documents for testing request, procedure, and result are suggested

Thank you

misook3@snu.ac.kr

Structural Conformance Testing Items

Test items	Details
Check inclusion of essential items	▸Check on essential descriptive items of component profile ▸Refer to component standard for essential descriptive items
Check limiting cardinality for each item	▸Check limiting cardinality for each item of component profile ▸Refer to component standard for limiting cardinality for each item
Check consistency between components	▸Check consistency between profiles or profile and source code
Checking essential items for source code implementation	▸Check essential implementation Class and Method

Dynamic Conformance Testing items

Test items	Details
Compatibility test between component execution middleware	▸Operation checked by calling the callback function on the execution engine ▸Refer to component standard for component basic callback function
State transition	▸Check basic state transition of component ▸Refer to component standard for component state transition diagram ▸Refer to component standard for state transition test value
Port standard	▸Check port standard described in component profile ▸Refer to Appendix I for port standard test value
Exception process	▸Check process related to abnormal standard or situation

Robotics-DTF Plenary Meeting
Opening Session

March 24th, 2011

Arlington, VA, USA

Hyatt Regency Crystal City Hotel

Approval of Minutes

Meeting Quorum : 3

AIST, ETRI, JARA, Technologic Arts

Minutes taker(s):

- **Geoffrey BIGGS**
- **Seung-Woog Jung**

Minutes review

Santa Clara Meeting Summary

Robotics Plenary: (18 participants)

- Special Talk
  - "(How we are) Building Blocks for Mobile Manipulation (that you can reuse)", Brian Gerkey, Willow Garage [robotics/2010-12-06]
- Initial Submission Presentations for RoIS
- Initial Submission Presentations for DDC4RTC
- RTC(Robot Technology Component) RTF proposal

Robotic Functional Service WG
WG Report

WG Co-Chairs: SuYoung Chi, Miki Sato, Toshio Hori

2011/03/24

WG activities before Washington D.C. meeting

- RoIS private meetings were held twice at Fukuoka (Jan.) and Pusan (Feb.).
- Discussions
  - Merging two proposals from Japan and Korea for revised submission
  - Fixing Basic HRI Components and their parameters

Discussion on Revised Submission (Tue. & Wed.)

- Parameters for each Basic HRI Component
  - Mandatory parameters are almost fixed in the previous meetings
  - There was little discussion on optional parameters.
- Definition of "Procedure"
  - Making "execute" receive a list of commands to be executed in sequence or in parallel
  - Defined several data types
    - See Ref.1 and Ref.2

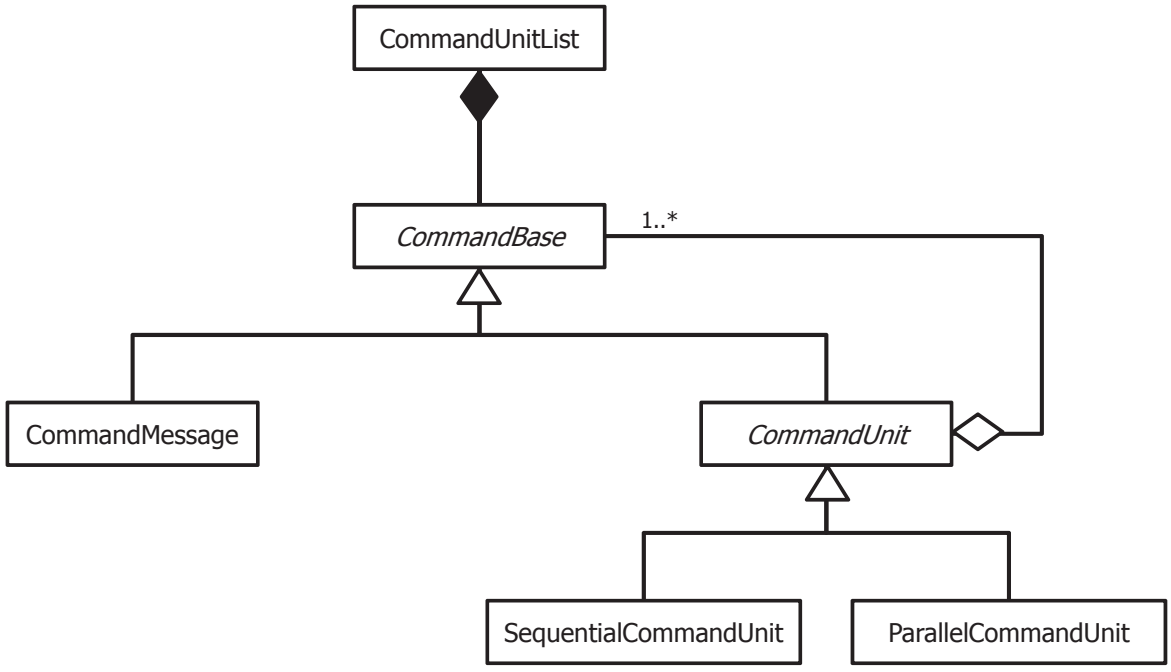
Discussion on Revised Submission (cont.)

- Data structure for ID with reference system
  - RoIS requires several IDs and each ID requires corresponding reference system in which ID is defined
  - A data type "RoIS Identifier" is defined by inheriting MD_Identifier [ISO19115]
- Difference between "navigation" and "move"
  - "Navigation" is based on RLS and target positions (way points and a destination) must be provided with their corresponding coordinate systems.
  - "Move" is used for small "relative" movements.
  - Arguments for "move" may need further discussions. (e.g. How to specify "turn"?)

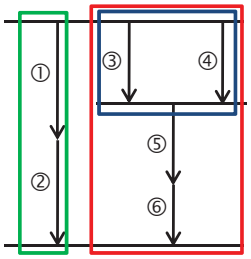
Tentative schedule of June meeting

- If we submit a revised RoIS submission in May, we'll attend AB for presenting the submission on Monday
  - So we may meet in Sunday afternoon (June 19) to prepare a presentation material and answers to AB comments

Ref.1 : Data types for "execute"



Ref.2 : Example of sequential/parallel commands execution in a procedure



XML notation

```
<CommandUnitList>
  <ParallelCommandUnit>
    <SequentialCommandUnit>
      <CommandMessage>①</CommandMessage>
      <CommandMessage>②</CommandMessage>
    </SequentialCommandUnit>
    <SequentialCommandUnit>
      <ParallelCommandUnit>
        <CommandMessage>③</CommandMessage>
        <CommandMessage>④</CommandMessage>
      </ParallelCommandUnit>
      <CommandMessage>⑤</CommandMessage>
      <CommandMessage>⑥</CommandMessage>
    </SequentialCommandUnit>
  </ParallelCommandUnit>
</CommandUnitList>
```

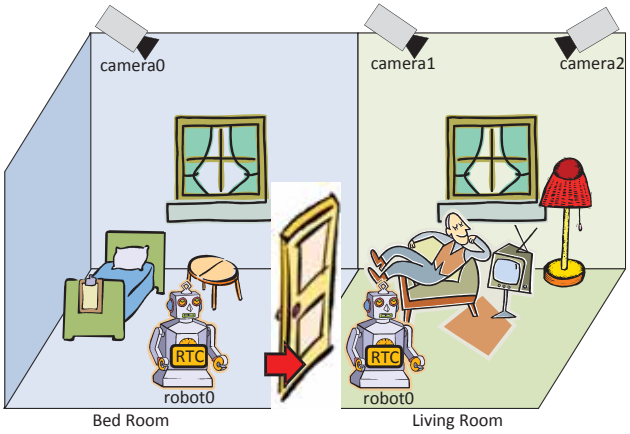
Infrastructure WG Progress Report
(Washington D.C. meeting)

Noriaki Ando (AIST)
robotics/2011-03-12

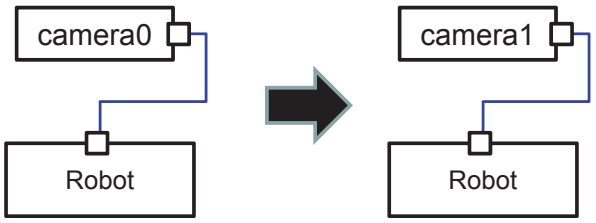
Topics of This Meeting

- Merging two initial submissions
- Reviewing D&C specification
  - To understand details of D&C spec.
  - To discuss more details use-case of DDC4RTC
  - To share common concept of DDC4RTC based on D&C specification
  - To make clear additional features for DDC4RTC
- Making index of merged specification with agreement
  - Assignment of homework

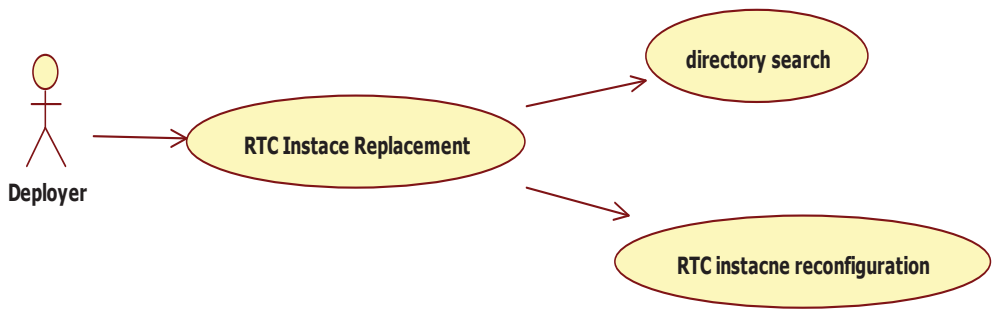
Scenario 1 : RTC Instance Replacement



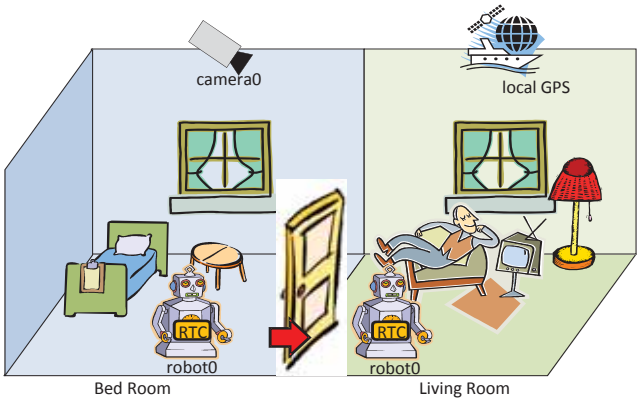
- Environment
  - Bed Room : camera0
  - Living Room : camera1, camera2
- Scenario
  - robot0 uses camera0 in Bed room
  - robot0 moves to Living Room from Bed room
  - reconfigure to make robot0 use camera1 instead of camera0



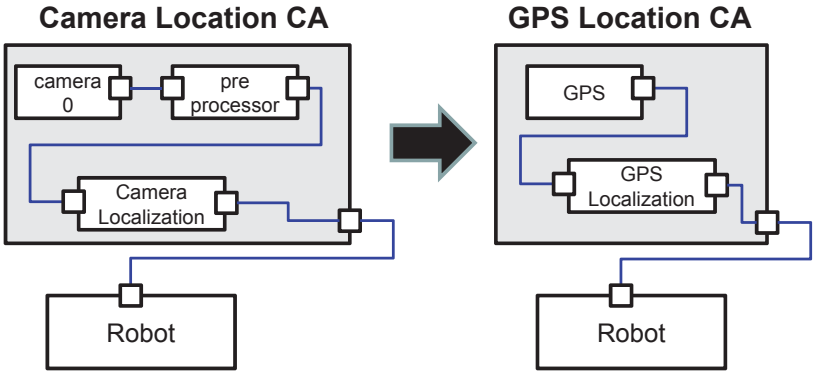
Scenario 1 : Usecases



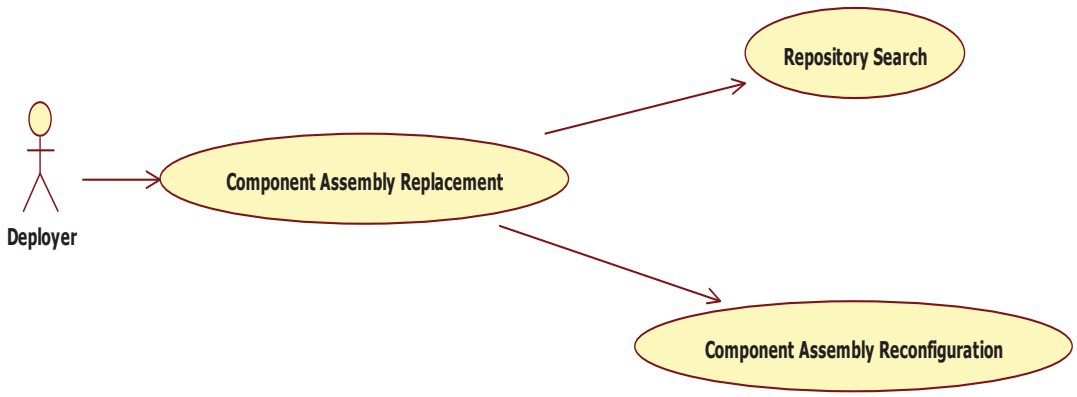
Scenario 2 : Component Assembly Replacement



- Environment
  - Bed Room : camera0
  - Living Room : Local GPS
- Scenario
  - robot0 uses camera0 for localization
  - robot0 moves to Living Room from Bed room
  - reconfigure to make robot0 use local GPS for localization



Scenario 2 : Usecases



DDC4RTC index

Platform Independent Model

Next

- Merged submission deadline has been postponed (Dec. meeting)
- Complete a draft merged specification before the next meeting.
- Discuss more detailed description of draft merged specification.

Roadmap for Robotics Activities

robotics/2011-03-13

Item	Status	Santa Clara CA Dec-2010	Washington DC Mar-2011	Salt Lake City UT Jun-2011	Orlando FL Sep-2011	Santa Clara CA Dec-2011	Washington DC Mar-2012	Cambridge MA Jun-2012	POC / Comment
Flyer of Robotics-DTF [Publicity Sub-Committee]	Suspended								
Robot Interaction Service (RoIS) Framework RFP [Robotic Functional Services WG]	In Process	Initial Submittion		Revised Submittion & Voting				FTF Report	
Dynamic Deployment and Configuration for RTC (DDC4RTC) RFP [Robotic Infrastructure WG] in MARS	In Process	Initial Submittion		Pre-review		Revised Submittion & Voting			Sponsor: MARS
JAUS-RTC White Paper [Modelling for Robotics WG]	Suspended								
Models for Robotics RFI [Modelling for Robotics WG]	Suspended								
Robotic Map Services RFP [Robotic Functional Services WG]	Planned								IEEE R&A?
etc…	Future								
Robotics Information Day [Technology Showcase]	Future								
RTC Revision Task Force	In Process	Charter		Comments Due: 6/1	RTF Report				
RLS Revision Task Force	In Process								will go to ISO/TC211

Related Events

					Chu-suk (Special Holidays in Korea)				

Robotics-DTF Plenary Meeting
Wrap-up Session

March 24th, 2010

Arlington, VA, USA

Hyatt Regency Crystal City Hotel

Document Number

robotics/2011-03-01 Final Agenda (Tetsuo Kotoku)
robotics/2011-03-02 Santa Clara Meeting Minutes [approved] (Miki Sato and Myung-Eun Kim)
robotics/2011-03-03 Review of ETRI Initial Submission (Seung-Woog Jung)
robotics/2011-03-04 How to apply policy concept for integration (Seung-Woog Jung)
robotics/2011-03-05 Discussion issues for supervision tree (Myung-Eun Kim)
robotics/2011-03-06 How to apply the repository and directory to the supervision tree? (Myung-Eun Kim)
robotics/2011-03-07 Robotic Functional Service WG - RoIS Framework - (Miki Sato)
robotics/2011-03-08 Proteus - French National Initiative - (Laurent Rioux)
robotics/2011-03-09 Conformance Testing Method for Robot Software Components (Mi-Sook Kim)
robotics/2011-03-10 Opening Presentation (Tetsuo Kotoku)

Document Number (cont.)

robotics/2011-03-11 Robotic Functional Services WG Report (Toshio Hori)
robotics/2011-03-12 Robotic Infrastructure WG Report (Noriaki Ando)
robotics/2011-03-13 Roadmap for Robotics Activities (Tetsuo Kotoku)
robotics/2011-03-14 Wrap-up Presentation (Tetsuo Kotoku)
robotics/2011-03-15 The number of downloads (Tetsuo Kotoku)
robotics/2011-03-16 Next Meeting Preliminary Agenda - DRAFT (Tetsuo Kotoku)
robotics/2011-03-17 DTC Report Presentation (Young-Jo Cho)
robotics/2011-03-18 Washington DC Meeting Minutes - DRAFT (Geoffrey Biggs and Seung-woog Jung)

Call for volunteer

- Robotics-DTF Co-Chair

=> Postpone voting one more meeting

New WG Charter

Modelling for Robotics

Charter [robotics/2010-06-12]

This working group is a sub-group of the Robotics Task Force. This working group is focusing on modelling engineering for robotics.

Chair:

- Takeshi Sakamoto (Technologic Arts)
- Laurent Rioux (THALES)
- Toby McClean (Zeligsoft)

Organization (from Mar. 24th, 2011)

Robotics-DTF
- Tetsuo Kotoku (AIST, Japan)
- Young-Jo Cho (ETRI, Korea)

Publicity Committee
- Abheek Bose (ADA Software, India)

Contacts Committee
- Makoto Mizukawa (Shibaura-IT, Japan)
- Young-Jo Cho (ETRI, Korea)
- Yun Koo Chung (ETRI, Korea)

Technical WGs

Infrastructure WG
- Noriaki Ando (AIST, Japan)
- Seung-Woog Jung (ETRI)

Robotic Functional Services WG
- Su-Young *Chi* (ETRI, Korea)
- Miki Sato (ATR, Japan)
- Toshio Hori (AIST, Japan)

Modelling for Robotics WG
- Takeshi Sakamoto (Technologic Arts)
- Toby McClean (Zeligsoft)

Robotic Localization Services 1.1 WG
- Jaeyeong Lee (ETRI, Korea)
- Yeon-Ho Kim (Samsung, Korea)
- Shuichi Nishio (JARA/ATR, Japan)

Robotic Technology Component 1.1 WG
- Geoffrey Biggs (JARA/AIST, Japan)
- Noriaki Ando (AIST, Japan)
- Seung Woog Jung (ETRI)

AIST

Next Meeting Agenda

June 20-24 (Salt Lake City, UT, USA)

Monday:

Opening Session (morning)
RoIS revised submission review, vote-to-vote, voting (am)
WG activity (pm)

Tuesday:

WG activity (am)
Robotics-DTF Plenary Meeting (pm)
- Guest and Member Presentation
- Contact reports

Wednesday:

Workshop on System Assurance and Safety for "Consumer Devices"

Thursday:

WG activity follow-up [if necessary]

AIST

Next Meeting Agenda

March 21-25, 2011 (Washington DC, USA)

Tuesday:

WG activity [Parallel WG Session]
- Service WG
- Infrastructure WG

Wednesday:

WG activity [Parallel WG Session]
- Service WG
- Infrastructure WG

Thursday:

WG activity [Parallel WG Session] (am)
- Service WG
- Infrastructure WG

Robotics-DTF Plenary Meeting (pm)
- Guest and Member Presentation
- Contact reports

NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

Next Meeting Agenda

June 22-26 (San Jose, Costa Rica)

Monday:

Localization FTF (AM)
WG activity [Parallel WG Session] **(am)**

Tuesday:

Steering Committee (morning)
WG activity [Parallel WG Session] (am)
Robotics-DTF Plenary Meeting (pm)
- •Guest and Member Presentation
- •Contact reports

Wednesday:

Localization FTF
WG activity follow-up **[if necessary]**

AIST

Next Meeting Agenda

Plan A

June 21-25 (Minneapolis, MN , USA)

Monday:

Opening Session (morning)
Robotic Interaction Service (RoIS) Framework RFP
2nd Review (am)
WG activity (pm)

Tuesday:

WG activity (am)
Robotics-DTF Plenary Meeting (pm)
- •Guest and Member Presentation
- •Contact reports

Wednesday:

WG activity follow-up [if necessary]

Thursday:

Robotic Interaction Service (RoIS) Framework RFP
Voting (am)

NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

Next Meeting Agenda

June 21-25 (Minneapolis, MN, USA)

Plan B

Tuesday:

Opening Session
WG activity [Parallel WG Session] (am)
Robotics-DTF Plenary Meeting (pm)
- **Guest and Member Presentation**
- **Contact reports**

Wednesday:

RLS-RTF Meeting
WG activity follow-up [if necessary]

AIST

Plenary Attendee (17 participants)

- Andrey Sadovykh (Softeam)
- Amaud Cuccuru (CEA LIST)
- Geoffrey Biggs (AIST)
- Joeng-Sook Kang (KNU)
- Laurent Rioux (THALES)
- Miki Sato (ATR)
- Mi-sook Kim (KNU)
- Myung-Eun Kim (ETRI)
- Noriaki Ando (AIST)
- Sebastien GERARD (CEA LIST)
- Seung-Woog Jung (ETRI)
- Su-Young Chi (ETRI)
- Takeshi Sakamoto (Technologic Arts)
- Tetsuo Kotoku (AIST)
- Toshio Hori (AIST)
- Yves BEKNARD (Airbus)
- Young-Jo Cho (ETRI)

NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

IROS2010 Workshop / Tutorial

IEEE/RSJ International Conference on Intelligent Robots and Systems

Aug 18-22 Taipei, Taiwan

http://www.iros2010.org.tw/

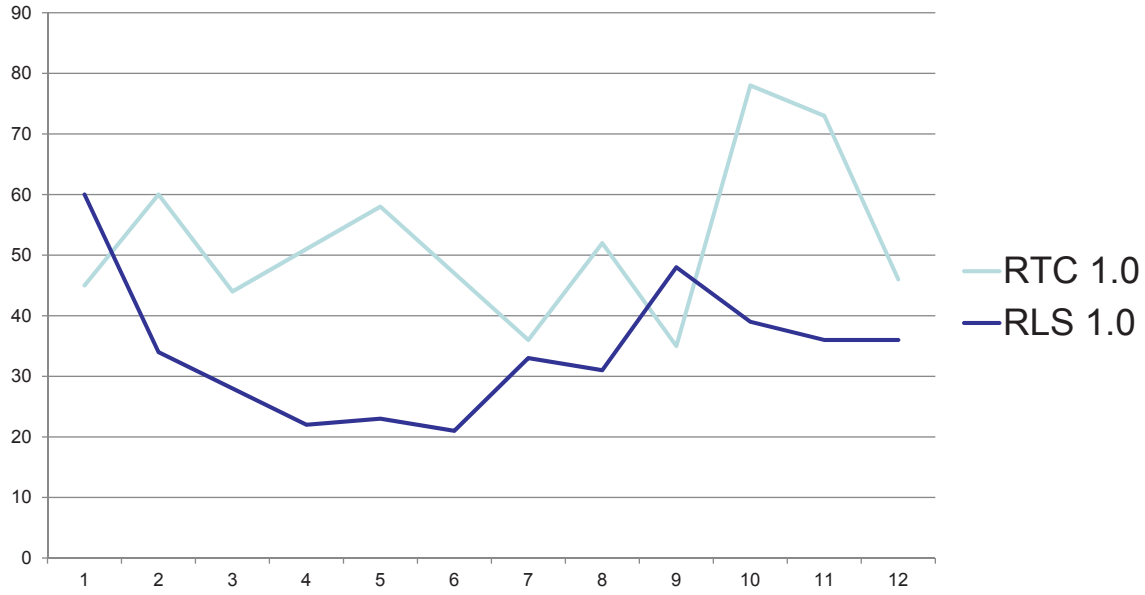
- W08 (Aug.18 full day)
  Workshop on Standardization for Service Robots: Current Status and Future Directions
- W18 (Aug. 22 PM)
  Best Practice in Robot Control Architectures for Service Robots

The number of downloads
(Robotics-DTF documents)

Tetsuo KOTOKU

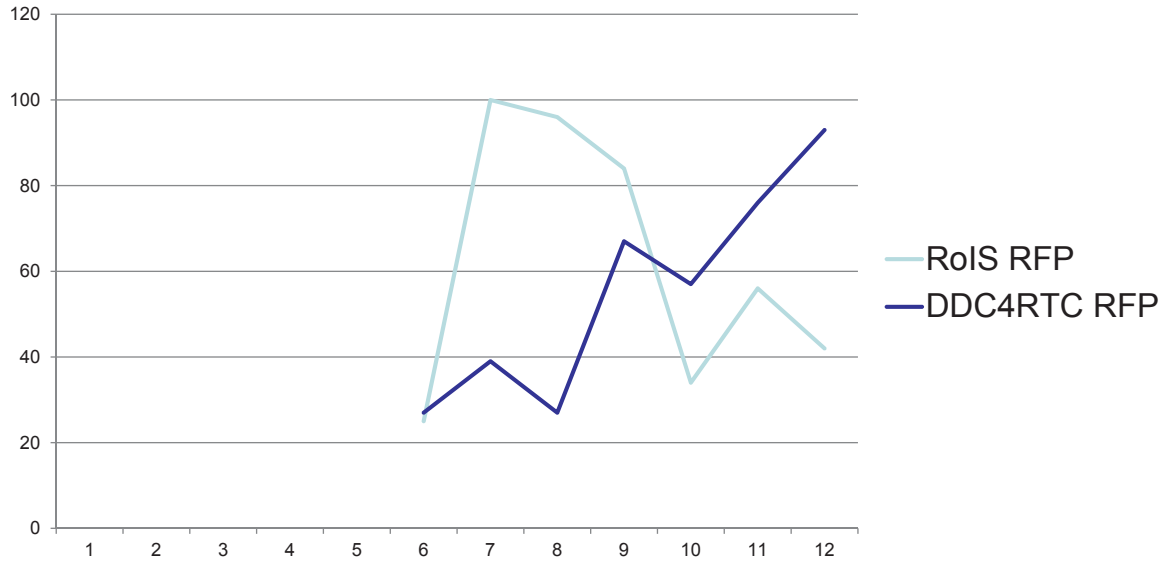
March 24th, 2011

Number of Downloads 2010



RTC 1.0: 625 downloads, RLS 1.0: 411 downloads

Number of Downloads 2010



RoIS RFP: 437 downloads, DDC4RTC RFP: 386 downloads

Robotics Domain Task Force Preliminary Agenda ver.0.0.2 robotics/2011-03-16						
OMG Technical Meeting - **Salt Lake City, UT, USA** -- June 20-24, 2011						
		TF/SIG		http://robotics.omg.org/		
		Host	Joint (Invited)	Agenda Item	Purpose	Room
Sunday: WG activites(pm)						
13:00	17:00			Robotics DDC4RTC and RoIS submitters meeting	Arrangement	
Monday:						
10:45	11:00	Robotics		Robotics-DTF Plenary Opening Session	presentation and discussion	
11:00	12:00	Robotics		**Revised Submission for RoIS RFP Review, Vote-to-Vote, and Voting** - Su-Young Chi (ETRI)	Robotics plenary closing	
12:00	13:00	**LUNCH**				
13:00	18:00			Architecture Board Plenary		
13:00	18:00			**DDC4RTC** (Robotic Infrastructure) WG(5h) - Noriaki Ando (AIST) and Seung-Woog Jung (ETRI)	discussion	
				RoIS (Robotic Functional Services) WG(5h): - Su-Young Chi (ETRI), Miki Sato (JARA/ATR) and Toshio Hori (AIST)	discussion	
Tuesday: WG activity						
9:00	12:00			**DDC4RTC** (Robotic Infrastructure) WG(3h) - Noriaki Ando (AIST) and Seung-Woog Jung (ETRI)	discussion	
				RoIS (Robotic Functional Services) WG(3h): - Su-Young Chi (ETRI), Miki Sato (JARA/ATR) and Toshio Hori (AIST)	discussion	
12:00	13:00	**LUNCH**				
13:00	13:45	Robotics		**Special Talk:** - TBA	presentation and discussion	
13:45	14:30	Robotics		**Special Talk:** - TBA	presentation and discussion	
				Break (30min)		
15:00	16:00	Robotics		WG Reports and Discussion (Service WG, Infrastructure WG, Models in Robotics WG)	presentation and discussion	
16:00	16:30	Robotics		Contact Reports: - Makoto Mizukawa(Shibaura-IT), and Young-Jo Cho(ETRI)	Information Exchange	
16:30	17:00	Robotics		Robotics-DTF Plenary Wrap-up Session (Roadmap and Next meeting Agenda)	Robotics plenary closing	
17:00				Adjourn joint plenary meeting		
17:00	17:30			Robotics WG Co-chairs Planning Session (Preliminary Agenda for next TM, Draft report for Friday)	planning for next meeting	
Wednesday: WG activitiy						
9:00	12:00	SysA		**Workshop on System Assurance and Safty for "Consumer Devices"**	discussion	
12:00	14:00	**LUNCH and OMG Plenary**				
14:00	17:00	SysA		**Workshop on System Assurance and Safty for "Consumer Devices"**	discussion	
18:00	20:00	**OMG Reception**				
Thursday: WG activitiy(am) and Robotics-DTF Plenary(pm)						
9:00	12:00			Robotics WG activity follow-up	discussion	
12:00	13:00	**LUNCH**				
13:00	18:00			Architecture Board Plenary		
17:00	18:00			Robotics WG activity follow-up	discussion	
Friday						
8:30	12:00			AB, DTC, PTC		
12:00	13:00	**LUNCH**				
Other Meetings of Interest						
Monday						
8:00	8:45	OMG		New Attendee Orientation		
Tuesday						
7:30	9:00	OMG		Liaison ABSC		
Please get the up-to-date version from http://staff.aist.go.jp/t.kotoku/omg/RoboticsAgenda.pdf						

Robotics-DTF

Date: Friday, 25th March, 2011
Chair:, T. Kotoku and Y. –J. Cho
URL: http://robotics.omg.org/
email: robotics@omg.org

➢Highlights from this Meeting:

Robotics Plenary: (17 participants)

- 2 Special Talks
  - "POTEUS(Platform for Robotic modeling and Transformation for End-Users and Scientific communities) project", Rioux Laurent, Thales [robotics/2011-03-08]
  - "Robotic component testing method", Mi-Sook Kim, Kangwon National University [robotics/2011-03-09]
- 2 WG Reports
  - **Robotic Functional Service WG**: RoIS(Robot Interaction Service) [robotics/2011-03-11]
  - **Robotic Infrastructure WG:** DDC4RTC(Decomposition & Dynamic Configuration for RTC [robotics/2011-03-12]
- Preliminary agenda for upcoming meeting [robotics/2012-12-16]

Robotics-DTF

Date: Friday, 25th March, 2011
Chair:, T. Kotoku and Y. –J. Cho
URL: http://robotics.omg.org/
email: robotics@omg.org

➢Future deliverables (In-Process):

- Dynamic Deployment and Configuration for RTC (DDC4RTC) revised submission
- Robotic Interaction Service(RoIS) Framework revised submission

➢Next Meeting (Washington DC):

- Election of a Robotics DTF Co-Chair
- Review of the revised submission of RoIS
- Discussion for revised submission of DDC4RTC
- Guest presentation
- Contact reports
- Roadmap discussion

Minutes of the Robotics DTF Meeting - DRAFT
March 21-25, 2011
Arlington, VA, USA
(robotics/2011-03-18)

Meeting Highlights

- Robotics Infrastructure WG meetings for integrating two initial submissions of the Dynamic Deployment and Configuration for Robotic Technology
- Robotics RoIS meetings for revision of submission of the Robotic Interaction Service (RoIS) Framework.
- Two special talks
  - PROTEUS Project, Laurent Rioux (Thales)
  - Conformance Testing Method for Robot Software Components, Mi-Sook Kim (Kangwon National University, KOREA)

List of Generated Documents

robotics/2011-03-01 Final Agenda (Tetsuo Kotoku)
robotics/2011-03-02 Santa Clara Meeting Minutes [approved] (Miki Sato and Myung-Eun Kim)
robotics/2011-03-03 Review of ETRI Initial Submission (Seung-Woog Jung)
robotics/2011-03-04 How to apply policy concept for integration (Seung-Woog Jung)
robotics/2011-03-05 Discussion issues for supervision tree (Myung-Eun Kim)
robotics/2011-03-06 How to apply the repository and directory to the supervision tree? (Myung-Eun Kim)
robotics/2011-03-07 Robotic Functional Service WG - RoIS Framework - (Miki Sato)
robotics/2011-03-08 Proteus - French National Initiative - (Laurent Rioux)
robotics/2011-03-09 Conformance Testing Method for Robot Software Components (Mi-Sook Kim)
robotics/2011-03-10 Opening Presentation (Tetsuo Kotoku)
robotics/2011-03-11 Robotic Functional Services WG Report (Toshio Hori)
robotics/2011-03-12 Robotic Infrastructure WG Report (Noriaki Ando)
robotics/2011-03-13 Roadmap for Robotics Activities (Tetsuo Kotoku)
robotics/2011-03-14 Wrap-up Presentation (Tetsuo Kotoku)
robotics/2011-03-15 The number of downloads (Tetsuo Kotoku)
robotics/2011-03-16 Next Meeting Preliminary Agenda - DRAFT (Tetsuo Kotoku)
robotics/2011-03-17 DTC Report Presentation (Young-Jo Cho)
robotics/2011-03-18 Washington DC Meeting Minutes - DRAFT (Geoffrey Biggs and Seung-woog Jung)

Minutes

Thursday, March 24, 2011, Prince William, 3rd FL

- 13:00 - 14:00 Special talk : PROTEUS Project, Laurent Rioux (Thales)
  - Nationwide project for robot development in France
  - Incorporating several challenges of varying complexity
- 14:00 - 14:20 Special talk : Conformance Testing Method for Robot Software Components, Mi-Sook Kim (Seoul / Kangwon National University)
  -Tools for testing components
  - Tools for verifying components comply with their specification and interfaces
- 13:00-16:00 Robotics DTF Plenary Meeting, Chair: Dr Kotoku
  - Participant organizations : AIST, ETRI, JARA, Technologic Arts
  - Minutes takers: Geoffrey Biggs (AIST) and Seung-Woog Jung (ETRI)
  - Santa Clara meeting minutes approved
    (Motion: AIST, Second: ETRI, White valet: Technologic Arts)

  - 15:05 - 15:15 Functional Service WG Report, Toshi Hori (AIST)
    . Discussion on RoIS framework draft proposal.
    . Parameters for each basic HRI component
    . Definition of "Procedure"
    . Discussion on data structures for IDs
    . Differences between "navigation" and "move" need further discussions
    . Deadline for revised submission is late May
  - 15:15 - 15:30 Infrastructure WG Report, Noriaki Ando (AIST)
    . Need to further understand the DEPL specification, so spent time reviewing it
    . Discussed scenarios for DDC4RTC
    . Have postponed the merged submission deadline until the December meeting.
  - 15:30 - 15:40 Wrap-up session
    . Call for volunteers for Robotics DTF co-chair
    . No volunteers postponed one meeting.
    . Changes in organization
    . New Robotic Technology Component 1.1 WG
    . Schedule for next meeting
    . Must have vote-to-vote for RoIS on Monday morning
    . Plenary meeting on Tuesday afternoon

ATTENDEE (17 participants)

- Andrey Sadovykh (Softeam)
- Amaud Cuccuru (CEA LIST)
- Geoffrey Biggs (AIST)
- Joeng-Sook Kang (KNU)
- Laurent Rioux (THALES)
- Miki Sato (ATR)
- Mi-Sook Kim (KNU)
- Myung-Eun Kim (ETRI)
- Noriaki Ando (AIST)
- Sebastien GERARD (CEA LIST)
- Seung-Woog Jung (ETRI)
- Su-Young Chi (ETRI)
- Takeshi Sakamoto (Technologic Arts)
- Tetsuo Kotoku (AIST)
- Toshio Hori (AIST)
- Young-Jo Cho (ETRI)
- Yves BEKNARD (Airbus)

Prepared and submitted by Geoffrey Biggs (AIST) and Seung-Woog Jung (ETRI)