

OpenRT Platform:

An Open Software Platform for Robotic Technologies

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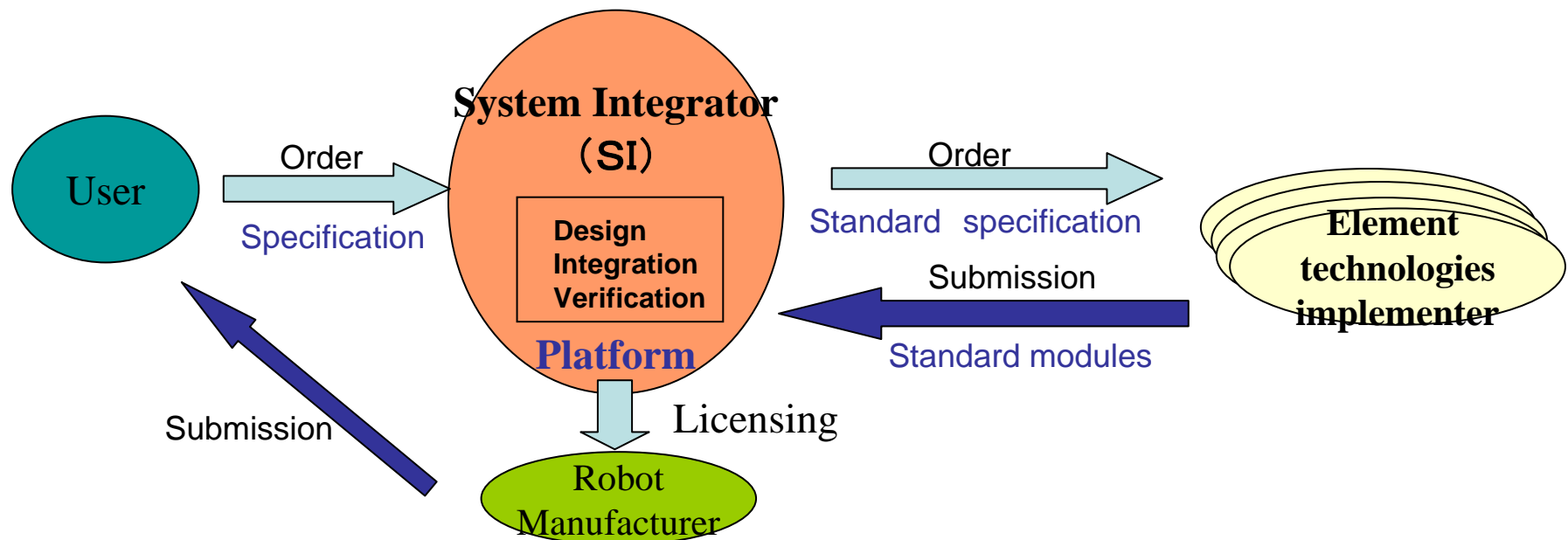
- Motivation
- Configuration of OpenRT Platform
 - RT Component and RT middleware called OpenRTM-aist
 - Tool chain
- Demonstration of the tools

- What we should do to reduce development costs?

Developing the framework to **reusable** robotic technologies (vision, audition, autonomous locomotion, control etc.) and to deploy them

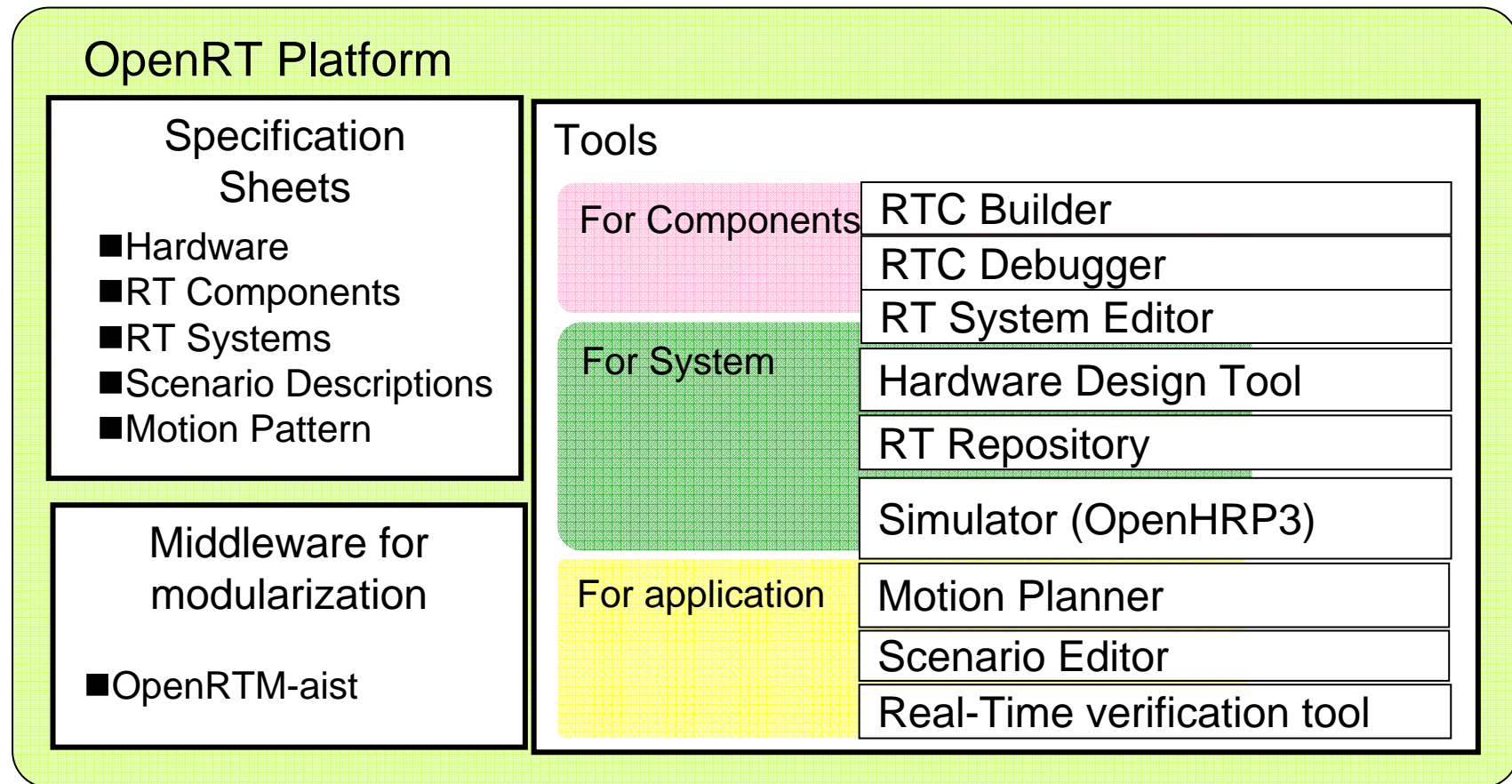
Modularize robotic technologies by using **standard** middleware technique

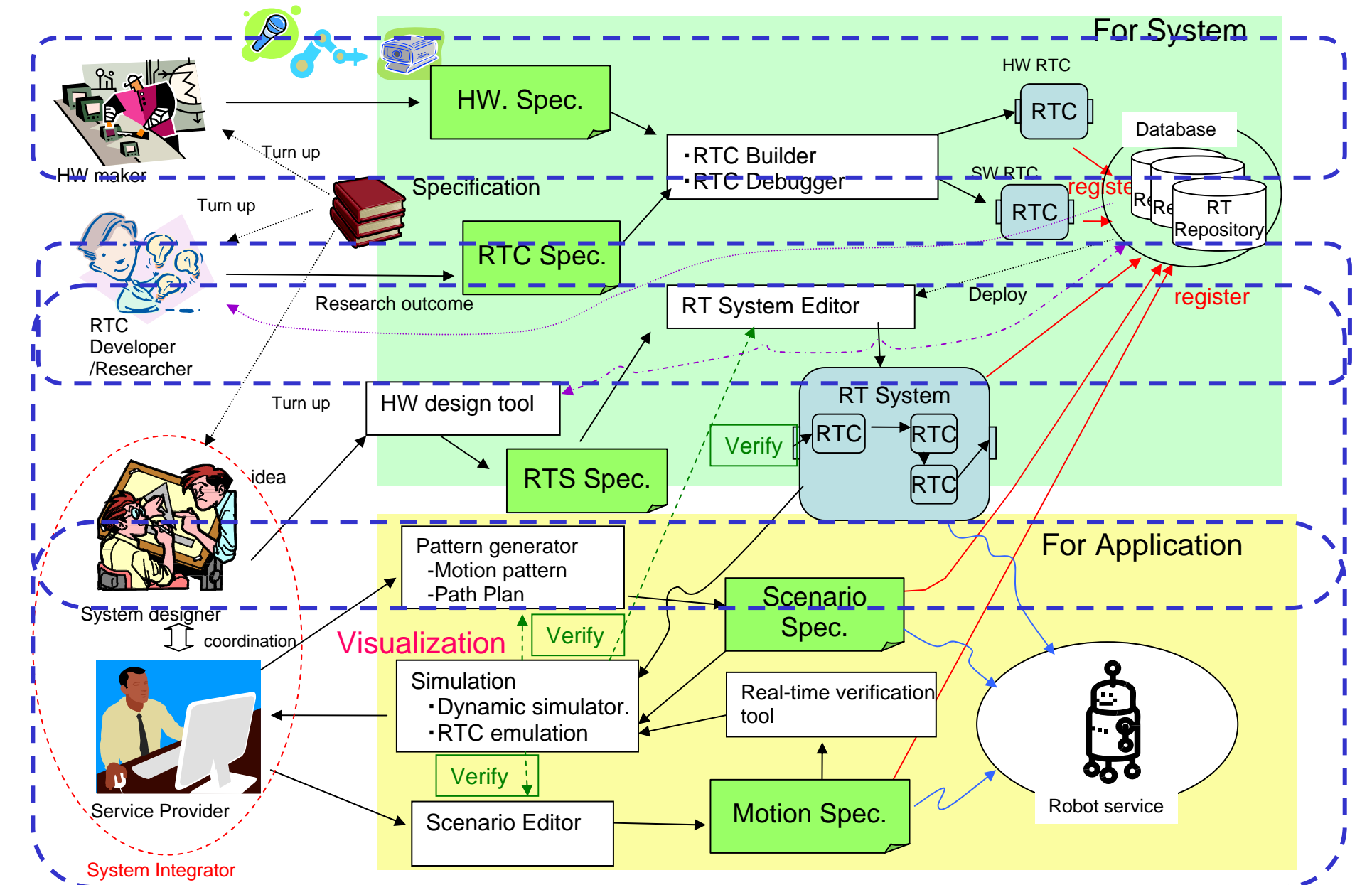
→ OpenRT Platform



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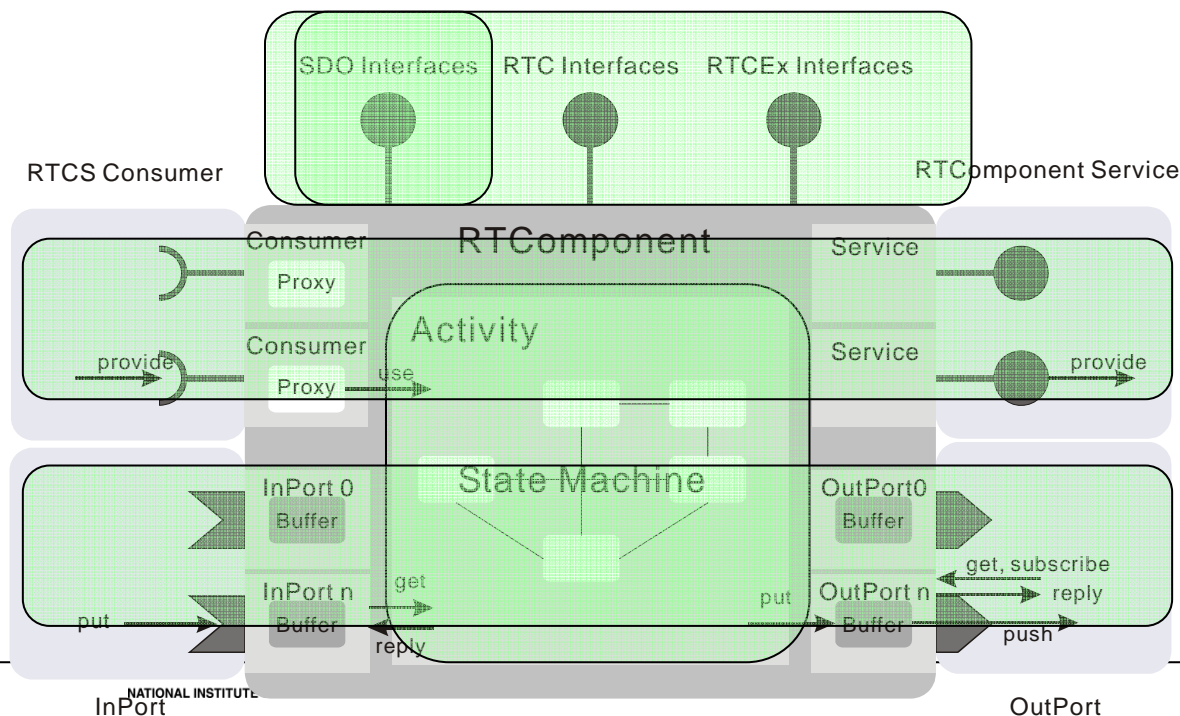
- Integrated development tools for developing RT components, RT systems and application scenarios

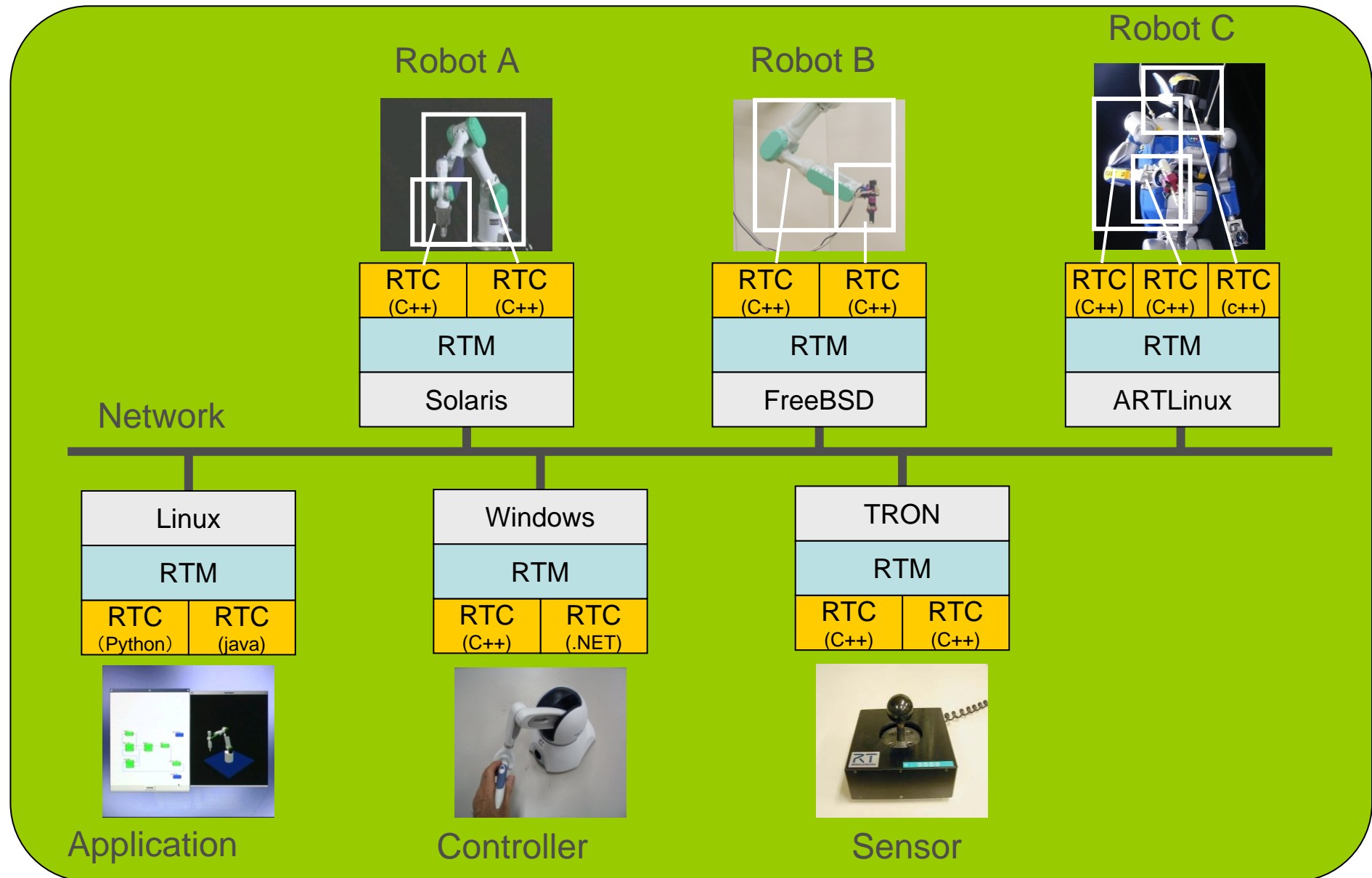




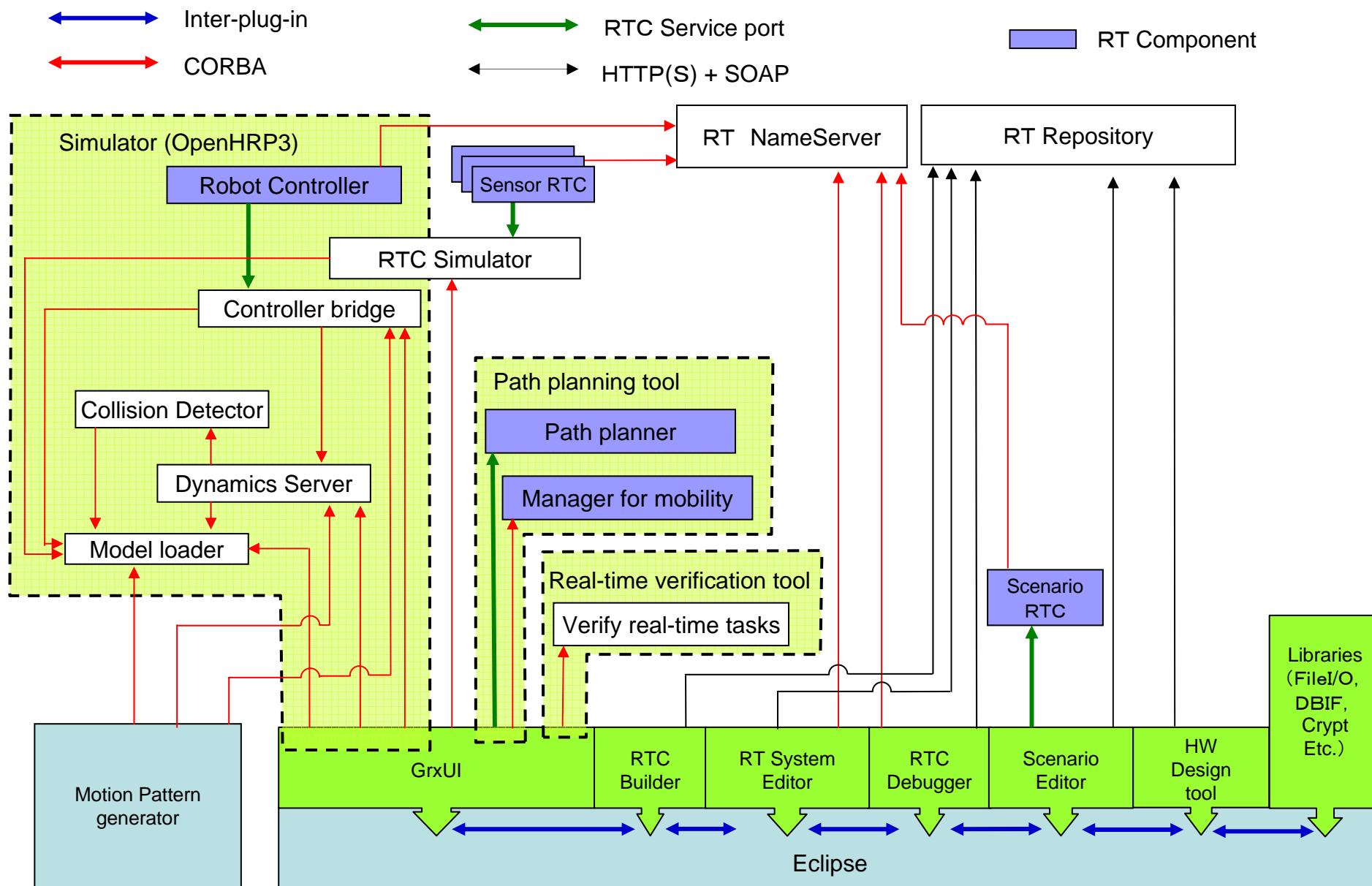
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- Component metadata for dynamic component assembly
- Component action and execution context for business logic execution
- Data ports for data exchange between RT components
- Service ports for service-oriented communication between RT components
- Configuration interface for runtime parameter setting

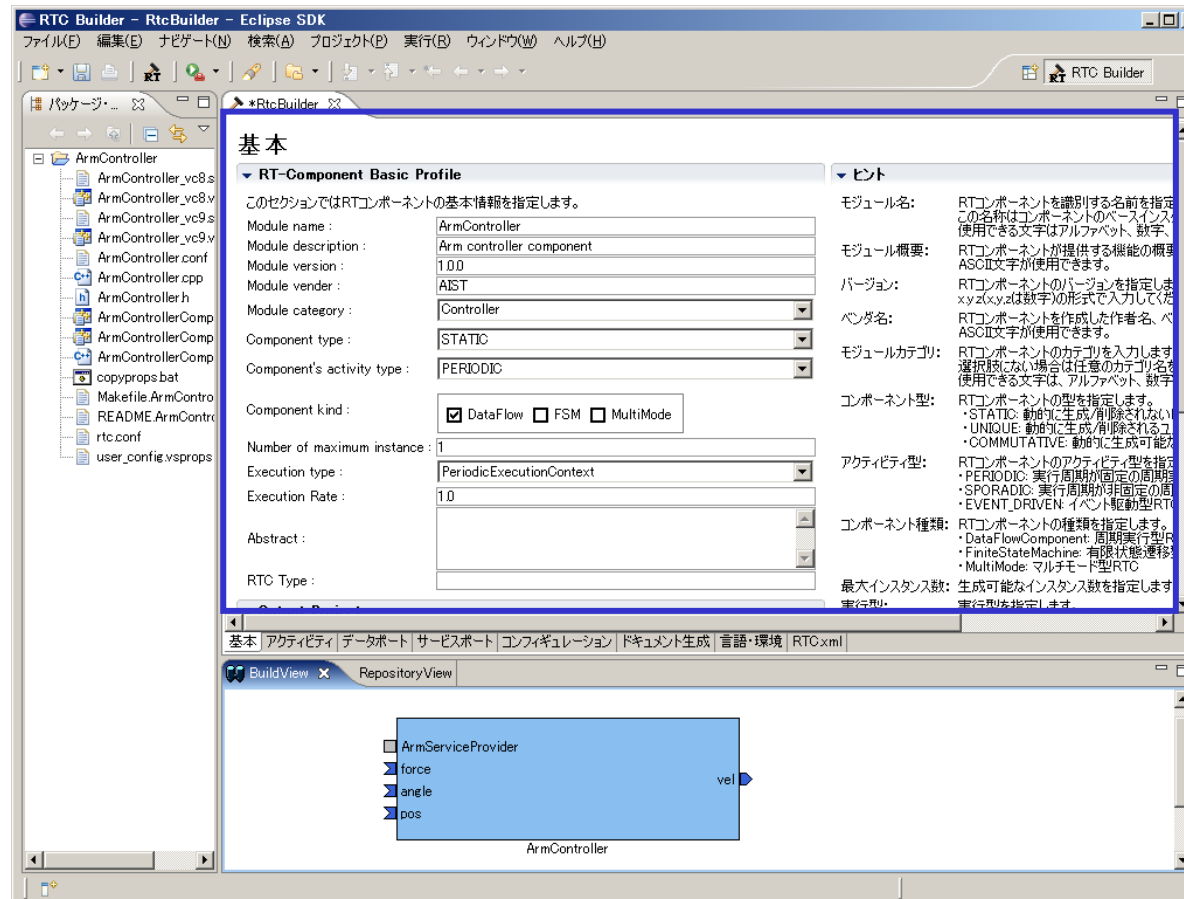




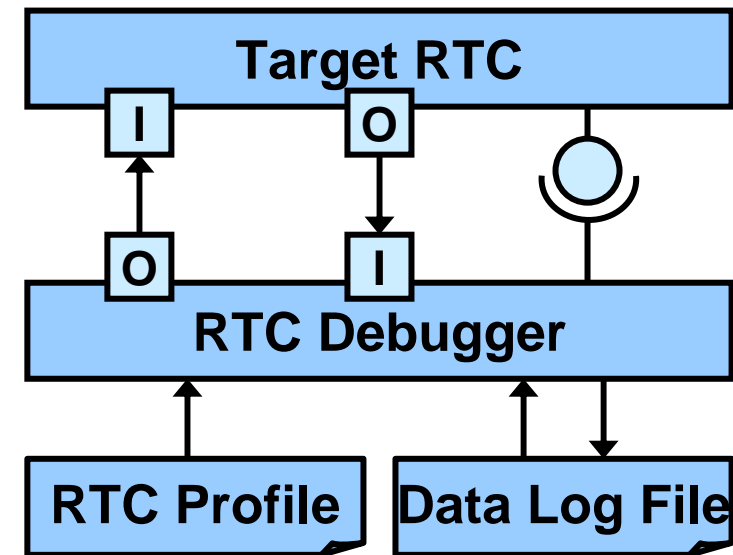
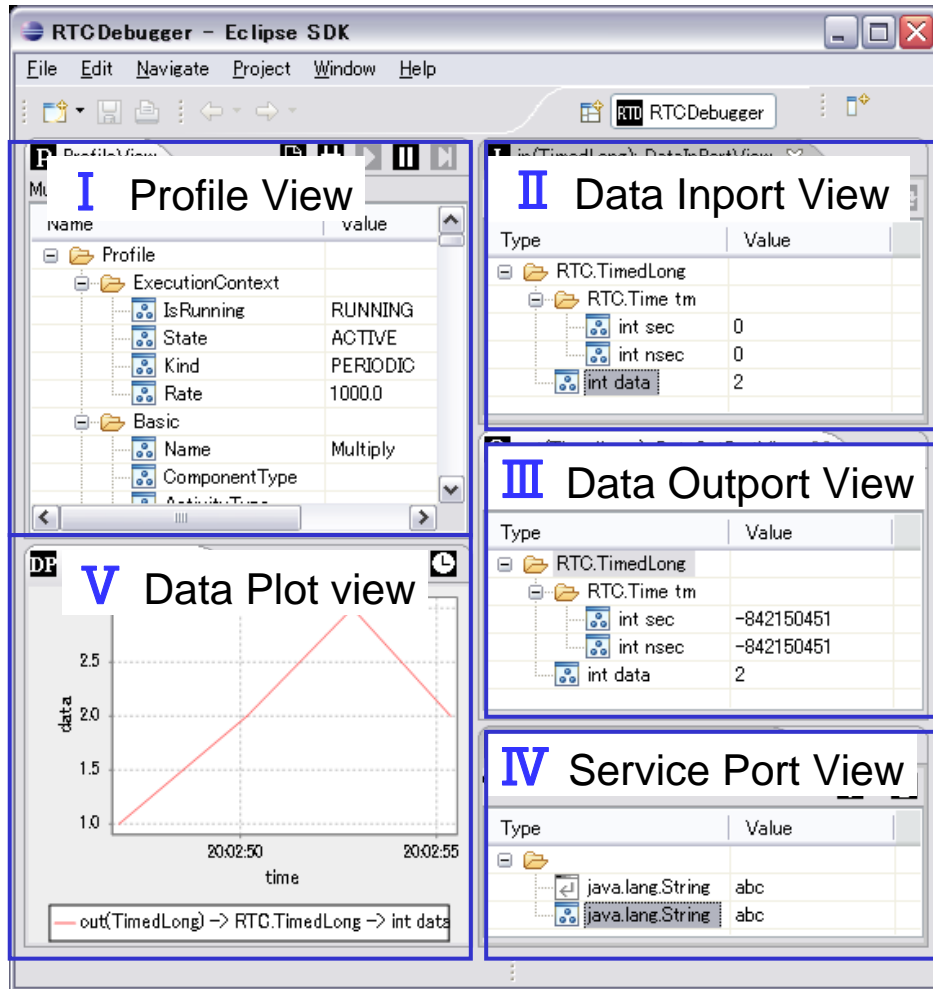
- Background
- Configuration of OpenRT Platform
 - RT Component and RT middleware called OpenRTM-aist
 - Tool chain
 - RTC builder, RTC debugger, RT system editor
 - Simulator, Motion planner, Scenario editor
 - Hardware design tool, RT repository
- Demonstration of the tools



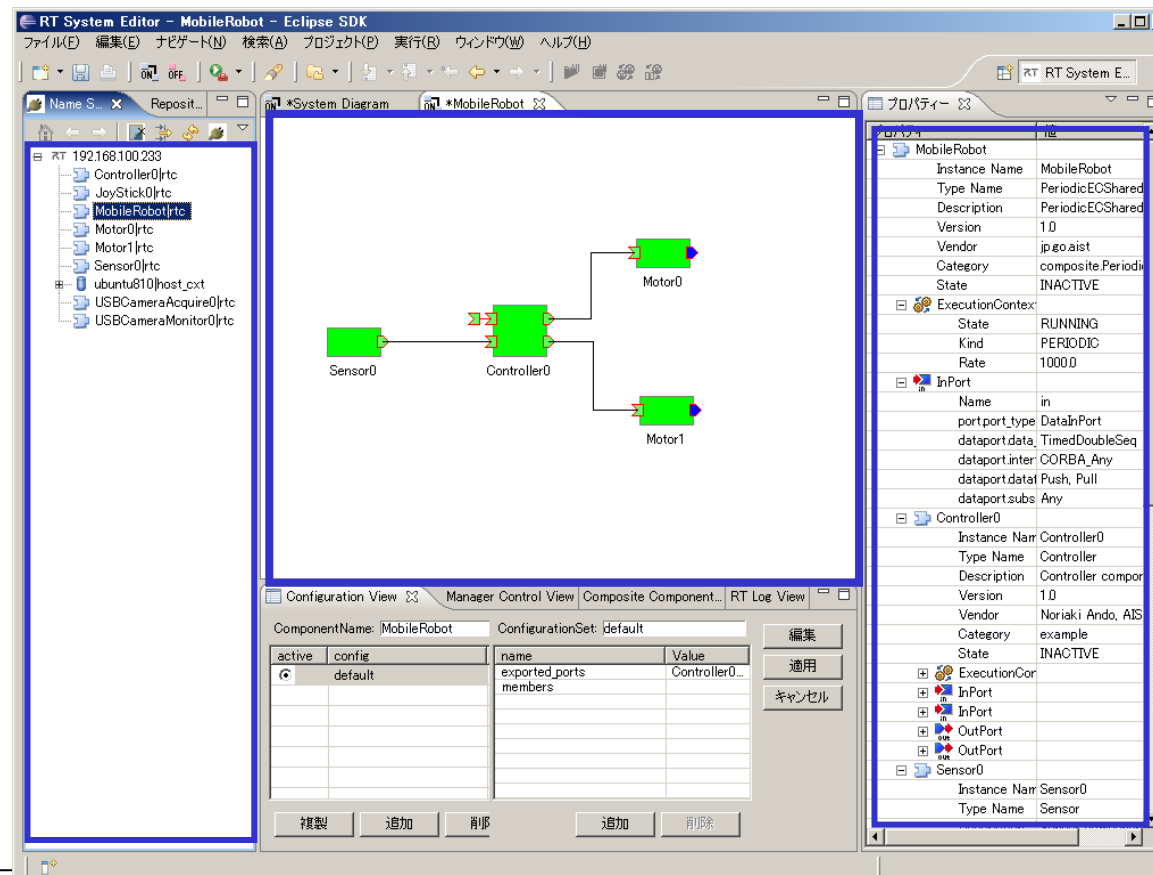
- Generating template code (C++,Python,Java) from RTC specifications
- Supporting RTC Profile v0.1



- Verifying input/output/service ports of a RTC

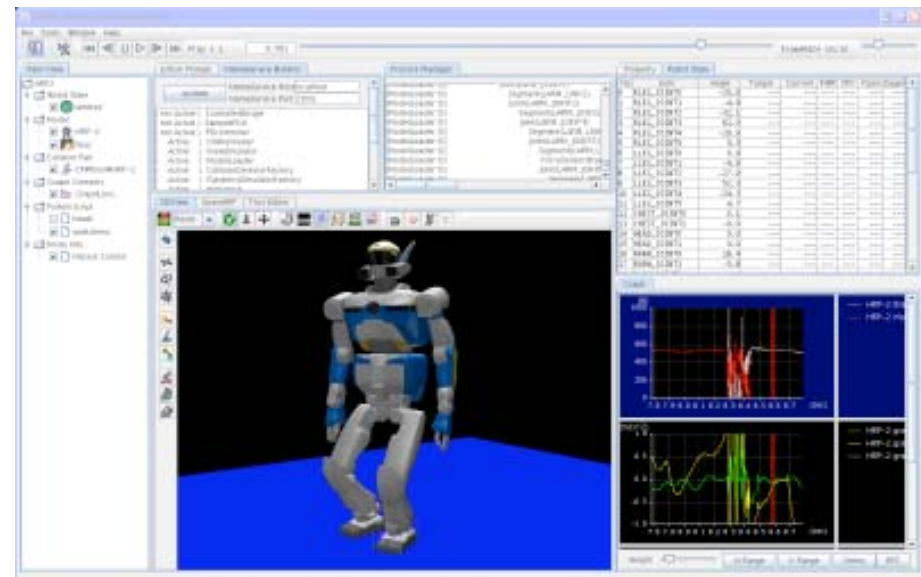


- Managing RTCs and links among RTCs
- Supporting Repository viewer
- Supporting RTS Profile v0.1

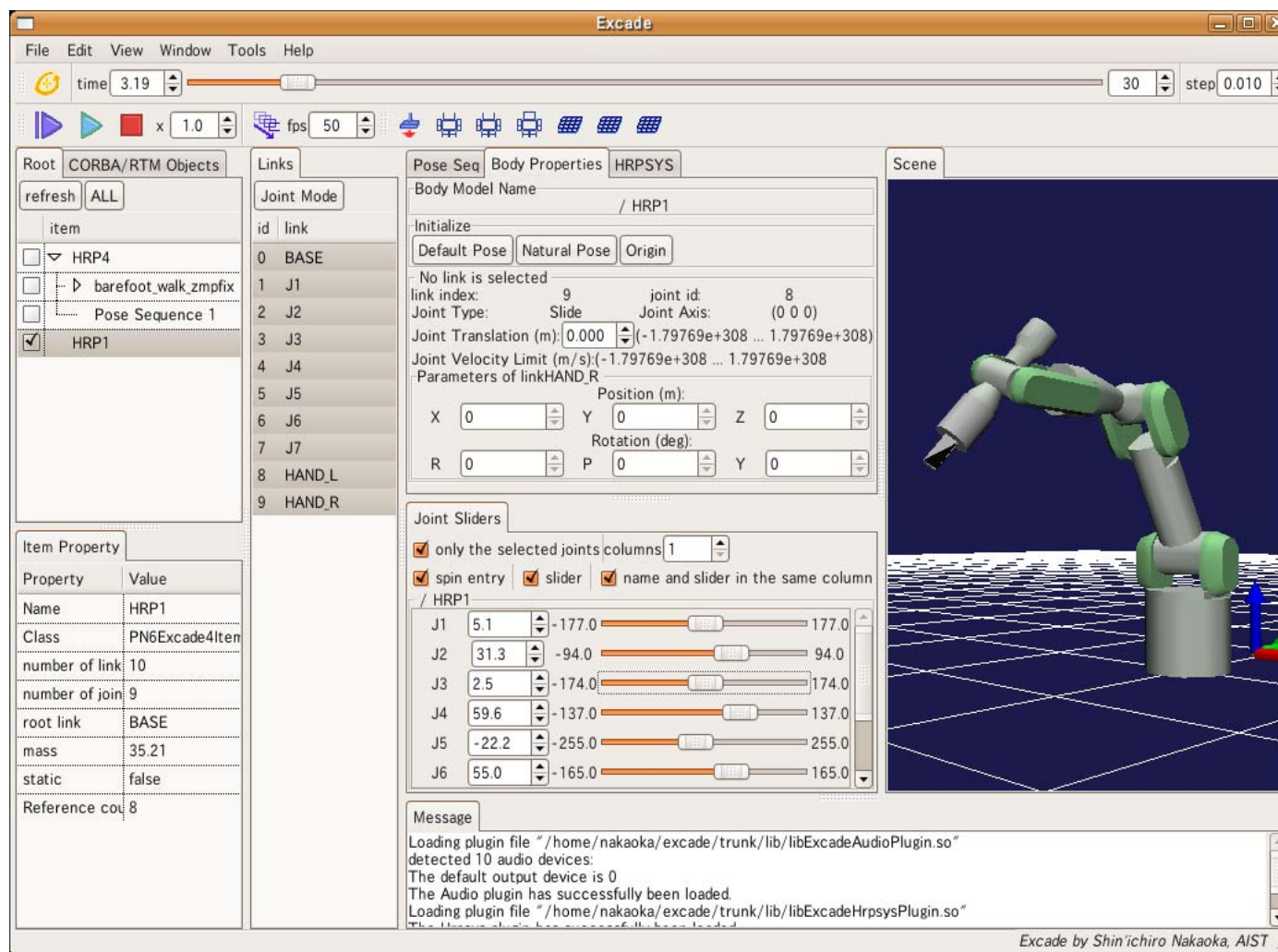


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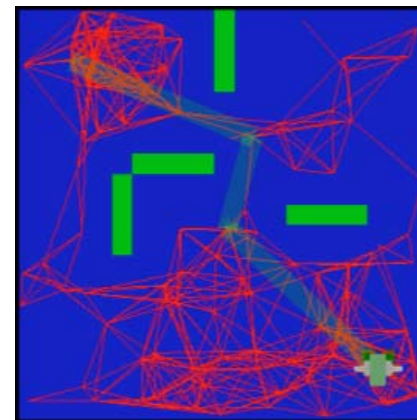
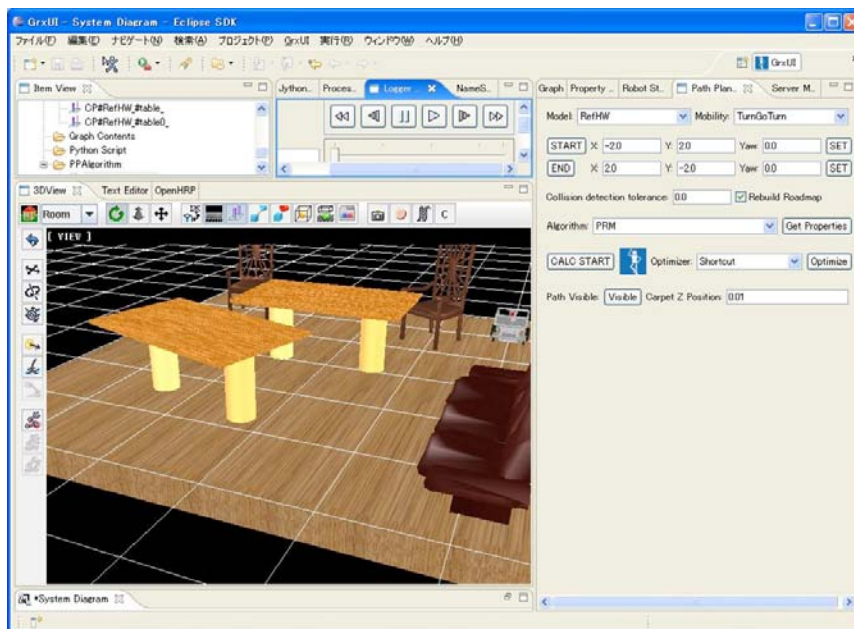
- Featherstone's $O(N)$ algorithm
- Contact force simulation using LCP solver
- Sensor simulation :
accelerometer, gyro, force/torque sensor,
camera, range sensor



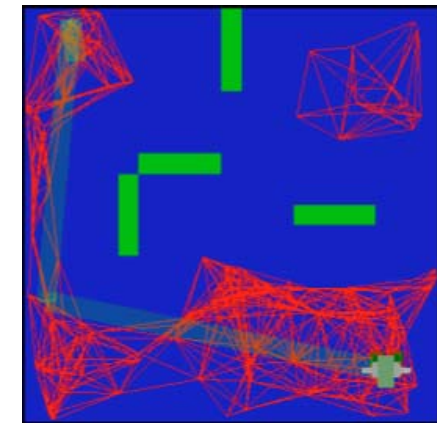
- Generating the motion patterns of robots given by a sequence of joint angle



- Generating 2-D paths in 3-D environment
- Supporting planning algorithms
 - RRT
 - PRM
- Supporting safety margin using distance computation

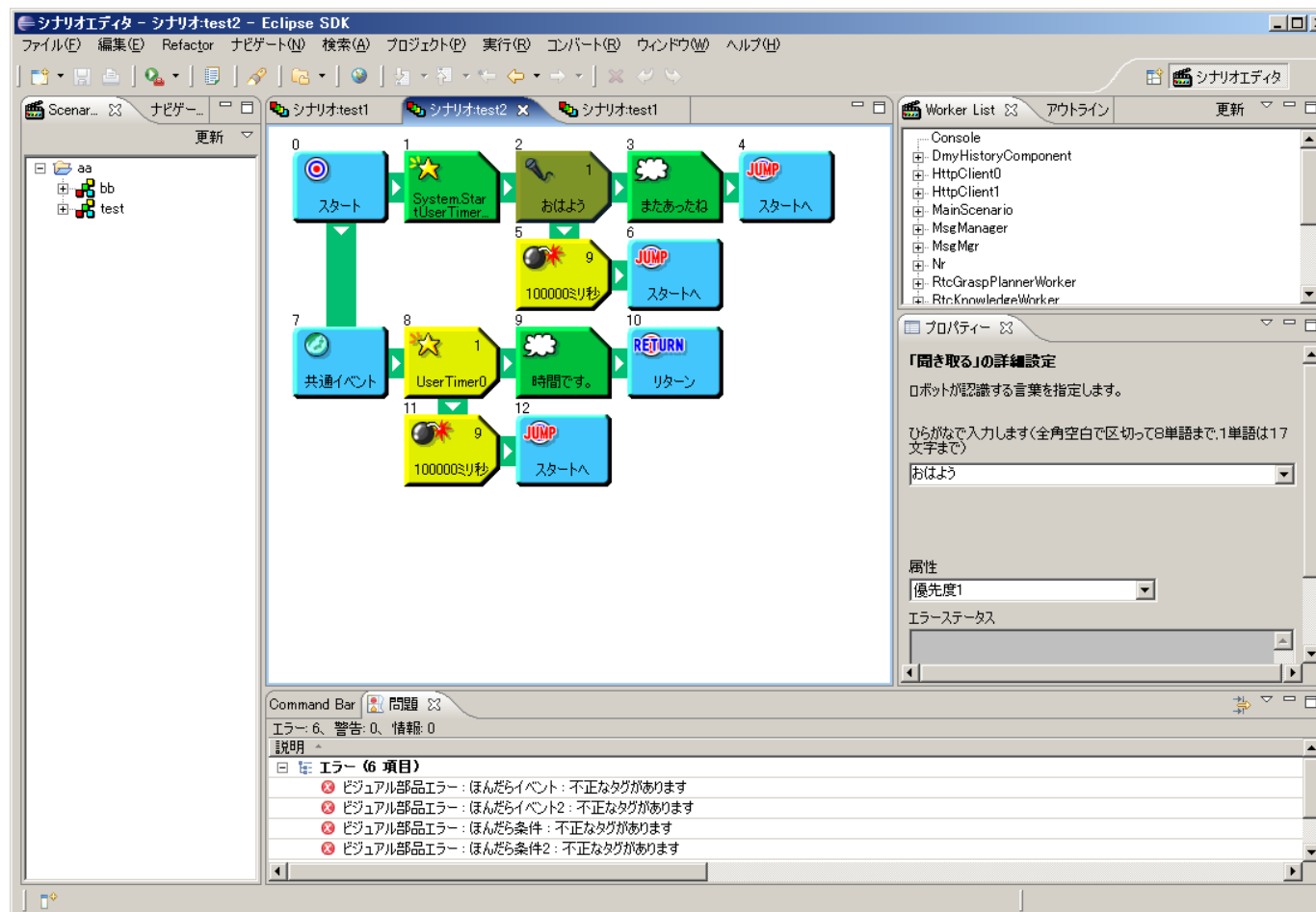


Safety margin=0



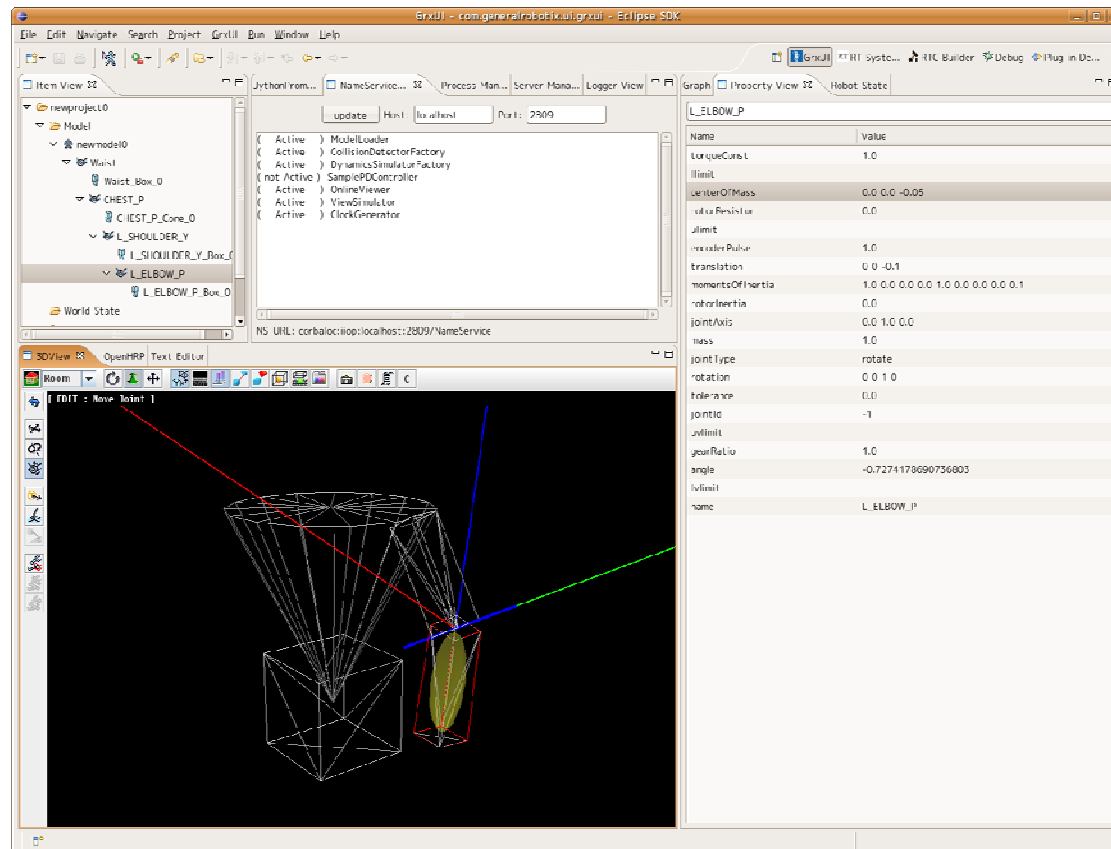
Safety margin=0.3

- Creating and editing a sequence of motion patterns by using a script language or GUI
- Controlling event flow among RT Components

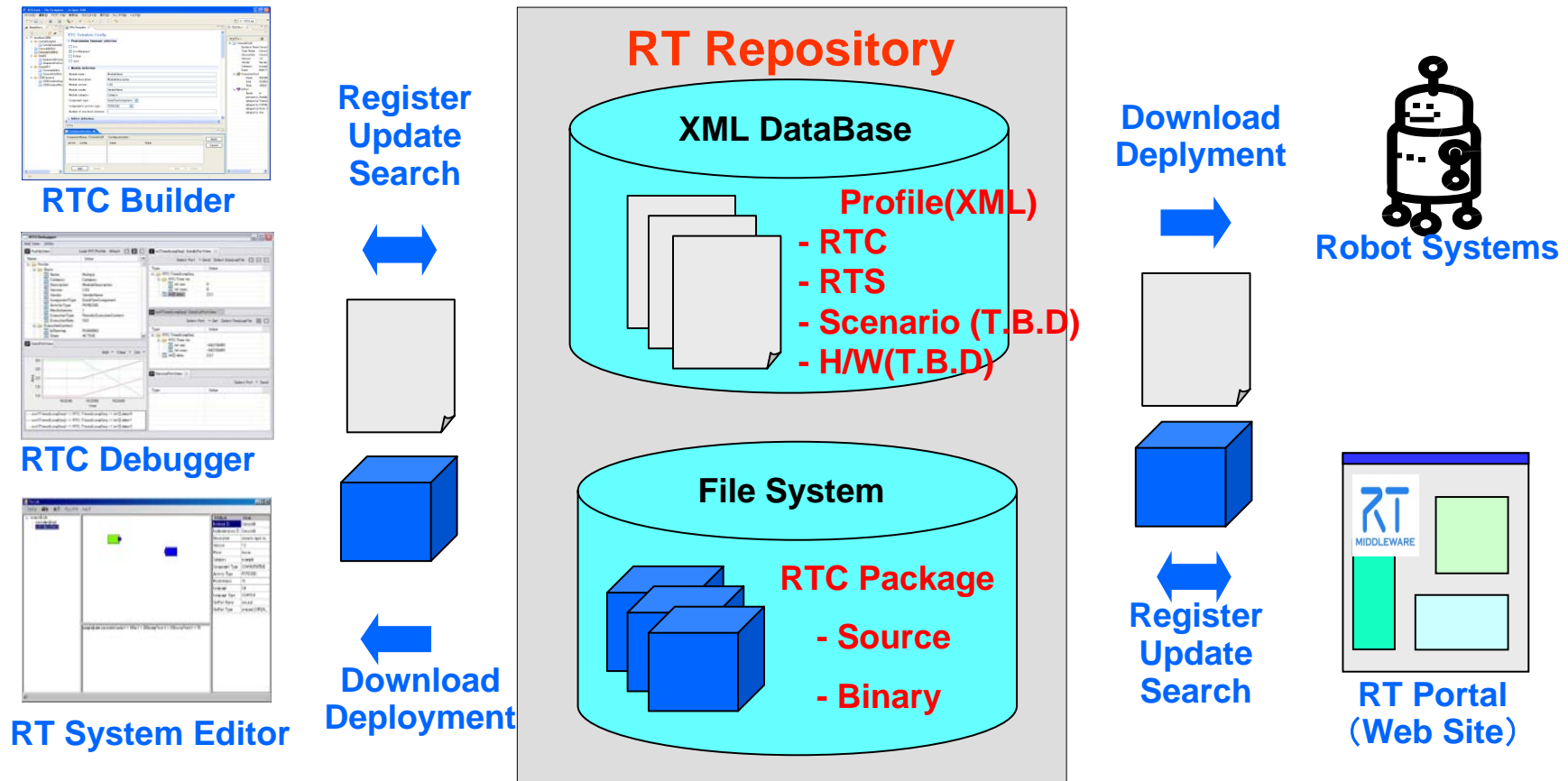


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 - Specification sheets of RT system
 - RTC builder, RTC debugger, RT system editor
 - Simulator, Motion planner, Scenario editor
 - Hardware design tool, RT repository
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- Helping the design of an RT system by combining RT components stored in RT repository
- Supporting to construct a geometry model for a dynamic simulation



- Supporting Public/personal database for RTC/RTS and profiles



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