

## Robotics Service Bus - Feature #1830

Feature # 44 (Resolved): Implement basic introspection support

### Initial support for participant hierarchies

04/01/2014 01:14 AM - J. Moringen

<b>Status:</b>	Resolved	<b>Start date:</b>	04/01/2014
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	J. Moringen	<b>% Done:</b>	100%
<b>Category:</b>	Common Lisp	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	rsb-0.11		
<b>Description</b>			

#### Associated revisions

##### Revision b55b2727 - 11/10/2014 08:44 PM - J. Moringen

Added parent parameter to participant creation functions in src/\*\*/protocol.lisp

refs #1830

- src/protocol.lisp (make-participant): accept parent keyword parameter; updated documentation string accordingly
  - (make-participant-using-class :around class t scope): pass value of parent keyword parameter to make participant hook but not to the next method
  - (make-listener): accept parent keyword parameter; updated documentation string accordingly
  - (make-reader): likewise
  - (make-informer): likewise
- src/patterns/request-reply/protocol.lisp (make-remote-server): likewise
  - (make-local-server): likewise
- src/patterns/request-reply/server.lisp (define-lazy-creation-method): pass method as parent to created participants
- src/patterns/request-reply/local-server.lisp (set-method): pass :parent initarg to created method
- src/patterns/request-reply/remote-server.lisp (ensure-method): likewise
- test/protocol.lisp (test hooks-root::make-participant-hook/smoke): added test cases involving a :parent initarg
- test/listener.lisp (define-basic-participant-test-cases listener): test :parent initarg using `simple-parent`
- test/listener.lisp (define-basic-participant-test-cases reader): likewise
- test/informer.lisp (define-basic-participant-test-cases informer): likewise
- test/package.lisp (package rsb.test): added exported symbol **simple-parent**
  - (mock-participant): new class; mock participant without any behavior
  - (register-participant-class mock-participant): register mock participant class
  - (**simple-parent**): new variable; a mock participant that can be used in tests which need a parent participant

- test/patterns/request-reply/local-server.lisp  
(define-basic-participant-test-cases local-server): test :parent  
initarg using ``simple-parent``
- test/patterns/request-reply/remote-server.lisp  
(define-basic-participant-test-cases :remote-server): likewise

## Revision ac827101 - 11/10/2014 08:44 PM - J. Moringen

Added introspection model in src/introspection/model.lisp

refs #1740, refs #1744, refs #1830

Introspection model classes

- for platform information: participants, processes and hosts.
- for messages: hello and bye
- src/introspection/types.lisp: new file; contains types used in the introspection module
- src/introspection/protocol.lisp (info-most-recent-activity): new generic function; return timestamp of most recent activity on the instances  
(info-clock-offset): new generic function; return estimated clock offset  
(info-latency): new generic function; return estimated communication latency  
(participant-info-kind): new generic function; return kind of participant  
(participant-info-id): new generic function; return id of participant  
(participant-info-parent-id): new generic function; return id of the parent of the participant  
(participant-info-scope): new generic function; return scope of participant  
(participant-info-type): new generic function; return type of participant  
(participant-info-transport): new generic function; return list of transports of the participant  
(process-info-process-id): new generic function; return id of the process  
(process-info-program-name): new generic function; return program name of the process  
(process-info-commandline-arguments): new generic function; return commandline options of the process  
(process-info-start-time): new generic function; return start time of the process  
(process-info-state): new generic function; return state of the process  
(process-info-transport): new generic function; return list of transports via which the process has been contacted  
(host-info-id): new generic function; return id of host  
(host-info-hostname): new generic function; return hostname of host  
(host-info-state): new generic function; return state of host  
(hello-participant): new generic function; return participant-info of the message

- (hello-process): new generic function; return process-info of the message
- (hello-host): new generic function; return host-info of the message
- (bye-id): new generic function; return participant id of the message
- src/introspection/model.lisp: new file; contains model classes for local and remote objects used by both local and remote introspection
- src/introspection/package.lisp (package rsb.introspection): added exported symbols info-most-recent-activity, info-clock-offset, info-latency, participant-info, remote-participant-info, participant-info-kind, participant-info-id, participant-info-parent-id, participant-info-scope, participant-info-type, participant-info-transport, process-info, remote-process-info, process-info-process-id, process-info-state, process-info-program-name, process-info-transport, process-info-commandline-arguments, process-info-start-time, current-process-info, host-info, remote-host-info, host-info-id, host-info-state, host-info-hostname, current-host-info, hello, hello-participant, hello-process, hello-host, bye, and bye-id
- test/introspection/model.lisp: new file; contains unit tests for the introspection model
- rsb-introspection.asd (system rsb-introspection): added defsystem-dependency on cl-protobuf; added module "protocol" with files files rsb/protocol/introspection/{Hello,Bye}.proto; added files src/introspection/types.lisp and src/introspection/model.lisp
- (system rsb-introspection-test): added file test/introspection/model.lisp

#### Revision 90bc27a4 - 11/10/2014 09:03 PM - J. Moringen

Added local introspection in src/introspection/local-introspection.lisp

fixes #1740, refs #1830

Local introspection is implemented as a database container information about the local host, the local process and local participants. Participants are tracked by hooking into `*make-participant-hook*` and `*participant-state-change-hook*`. Changes, queries and requests are processed using a listener, an informer and a local-server.

- src/introspection/protocol.lisp (introspection-processes): new generic function; return processes of a container
- (find-process): new generic function; find a process in a container
- (self find-process): new generic function; store a process in a container
- (ensure-process): new generic function; ensure a process exists in a container
- (introspection-hosts): new generic function; return hosts of a container
- (find-host): new generic function; find a host in a container
- (self find-host): new generic function; store a host in a container
- (ensure-host): new generic function; ensure a hosts exists in a

- container
- src/introspection/variables.lisp (**survey-filter**): new variable; stores a filter for introspection surveys
- (**broadcast-filter**): new variable; stores a filter for introspection broadcasts
- (**introspection-host-converters**): new variable; stores converters for host-related introspection communication
- (**introspection-all-converters**): new variable; stores converters for generic introspection communication
- (**local-database**): new variable; stores the local introspection database
- (**local-database-lock**): new variable; stores a lock protecting the local database
- (call-with-local-database): new function; call a thunk with the local database, creating and locking it if necessary/requested
- (with-local-database): new macro; similar
- (register-participant): new function; register a participant in the local introspection database
- (unregister-participant): new function; unregister a participant from the local introspection database
- (handle-make-participant): new function; handler for `*make-participant-hook*` that calls `register-participant` when appropriate
- (handle-participant-state-change): new function;
- (toplevel): register `*make-participant-hook*` and `*participant-state-change-hook*` handlers
- src/introspection/local-introspection.lisp: new file; contains `introspection-sender` and `local-introspection`
- src/introspection/package.lisp (package `rsb.introspection`): added exported symbols `introspection-processes`, `find-process`, `ensure-process`, `introspection-hosts`, `find-host`, and `ensure-host`
- test/introspection/local-introspection.lisp: new file; contains unit test for `local-introspection` and related functionality
- test/introspection/package.lisp (package `rsb.introspection.test`): added used package `rsb.patterns.request-reply`
- `rsb-introspection.asd` (system `rsb-introspection`): added file
- src/introspection/local-introspection.lisp
- (system `rsb-introspection-test`): added file
- test/introspection/local-introspection.lisp

## Revision 708c28e2 - 11/10/2014 09:05 PM - J. Moringen

Added remote introspection in `src/introspection/remote-introspection.lisp`

fixes #1744, fixes #1830, fixes #1833

The remote introspection implementation consists of three layers:

- `introspection-receiver` handles the event protocol and dispatches broadcasts and replies
- database object classes `{participant,process,host}-entry` are stored and maintained in a `remote-introspection-database`
- `remote-introspection` is a participant class that ties everything together by instantiating and configuring `introspection-receiver`

instances and a database and performing timed updates.

- src/introspection/protocol.lisp (database-change-hook): new generic function; return the change hook of an introspection database object (introspection-survey): new generic function; survey remote objects (introspection-ping): new generic function; ping a remote object (entry-info): new generic function; return info instance associated to entry object (entry-parent): new generic function; return parent entry of an entry (entry-children): new generic function; return child entries of an entry
- src/introspection/mixins.lisp (change-hook-mixin): new class; can be mixed into database classes to provide a change hook (database-change-hook): new method; return database change hook
- src/introspection/remote-introspection.lisp: new file; contains remote introspection implementation with `introspection-receiver`, `{participant,process,host}-entry`, `remote-introspection-database` and `remote-introspection` classes
- src/introspection/package.lisp (package rsb.introspection): added imported-from rsb.patterns.request-reply symbols remote-call-error, future-done? future-result, server-method and call; added exported symbols database-change-hook, introspection-survey, introspection-ping, entry-info, participant-entry, entry-parent, entry-children, process-entry and host-entry
- test/introspection/remote-introspection.lisp: new file; unit tests for remote introspection functionality
- test/introspection/package.lisp (package rsb.introspection.test): added imported-from rsb.introspection symbol remote-introspection-database
- rsb-introspection.asd (system rsb-introspection): added file src/introspection/remote-introspection.lisp (system rsb-introspection-test): added file test/introspection/remote-introspection.lisp

## History

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**#1 - 11/10/2014 09:10 PM - J. Moringen**

- *Status changed from In Progress to Resolved*
- *% Done changed from 60 to 100*

Applied in changeset commit:rsb-cl|708c28e28fd9948726c29b8e3d7e5839c560947a.