

Robotics Service Bus - Feature #1744

Feature # 44 (Resolved): Implement basic introspection support

Implement introspection event receiver and client API

02/06/2014 06:32 PM - J. Moringen

Status:	Resolved	Start date:	03/24/2014
Priority:	Normal	Due date:	03/24/2014
Assignee:	J. Moringen	% Done:	100%
Category:	Common Lisp	Estimated time:	0.00 hour
Target version:	rsb-0.11		
Description			
Related issues:			
Blocks Robotics Service Bus - Feature # 1751: Create introspection tool		Resolved	03/24/2014 03/24/2014

Associated revisions

Revision dd56e082 - 11/10/2014 08:44 PM - J. Moringen

Initial introspection infrastructure in src/introspection/*.lisp

refs #1740, refs #1744

- src/introspection/conditions.lisp: new file; contains conditions used by the introspection module
- src/introspection/protocol.lisp: new file; contains protocol functions of the introspection module
- src/introspection/variables.lisp: new file; contains functions for constructing introspection-related scopes and parameters holding default scopes
- src/introspection/package.lisp: new file; package definition for introspection module
- test/introspection/package.lisp: new file; package definition for unit tests of introspection module
- rsb-introspection.asd: new file; system description for rsb-introspection system
- lift-introspection.config: new file; lift configuration for testing the rsb-introspection system
- CMakeLists.txt (test): new function; configure execution of unit tests of one (sub-)system; use to test cl-rsb and rsb-introspection as two separate systems

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 8c1455bd - 11/10/2014 08:44 PM - J. Moringen

Added converters for introspection messages in src/introspection/conversion.lisp

refs #1740, refs #1744

- src/introspection/conversion.lisp: new file; contains converters between rsb.protocol.introspection.{Hello,Bye} protocol buffer messages and rsb.introspection:{hello,bye} classes
- rsb-introspection.asd (system rsb-introspection): added file src/introspection/conversion.lisp

Revision 29ab7684 - 11/10/2014 08:44 PM - J. Moringen

Added introspection mixins in src/introspection/mixins.lisp

refs #1740, refs #1744

- src/conditions (no-such-participant-error): new condition; signaled when a participant cannot be found in a container
- src/introspection/protocol.lisp (introspection-participants): new generic function; return participants of a container (self introspection-participants): new generic function; set participants of a container (introspection-participants/roots): new generic function; return root participants of a hierarchical container (call-with-database-lock): new generic function; call a thunk holding a database lock
- src/introspection/mixins.lisp: new file; contains mixin classes used in the introspection module
- src/introspection/package.lisp (package rsb.introspection): added exported symbols no-such-participant-error, no-such-participant-error-container, no-such-participant-error-id, introspection-participants, introspection-participants/roots, find-participant, call-with-database-lock and with-database-lock
- rsb-introspection.asd (system rsb-introspection): added file src/introspection/mixins.lisp

Revision 0a411c62 - 11/10/2014 09:04 PM - J. Moringen

Added timing-tracker in src/introspection/timing-tracking.lisp

fixes #2037, refs #1744

The `timing-tracker` class applies the basic NTP algorithm to estimate clock offsets of remote hosts as well as communication latencies of remote hosts and processes.

- src/introspection/protocol.lisp (timing-tracker-clock-offset): new generic function; return estimated clock offset
(timing-tracker-latency): new generic function; return estimated communication latency
(timing-tracker-to-local-clock): new generic function; transform timestamp from remote clock to local clock
- src/introspection/timing-tracking.lisp: new file; contains `tracked-quantity` and `timing-tracker` classes
- test/introspection/timing-tracking.lisp: new file; contains unit tests for the `timing-tracker` class
- rsb-introspection.asd (system rsb-introspection): added file
src/introspection/timing-tracking.lisp
(system rsb-introspection-test): added file
test/introspection/timing-tracking.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

#1 - 03/18/2014 04:36 AM - J. Moringen

- % Done changed from 60 to 70

#2 - 09/14/2014 01:00 PM - J. Moringen

- Category changed from Common Lisp to Introspection

#3 - 09/14/2014 03:46 PM - J. Moringen

- Category changed from Introspection to Common Lisp

#4 - 11/10/2014 09:10 PM - J. Moringen

- Status changed from In Progress to Resolved

- % Done changed from 70 to 100

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