

## RSBag - Enhancement #2572

### Improve replay performance for large numbers of channels

06/19/2016 05:07 PM - J. Moringen

<b>Status:</b>	Resolved	<b>Start date:</b>	06/19/2016
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	J. Moringen	<b>% Done:</b>	100%
<b>Category:</b>	Replay	<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	rsb-0.17		
<b>Description</b>			
Replays with large number of channels currently perform badly because the parallel iterator stepping does lots of unnecessary timestamp comparisons.			

#### Associated revisions

##### Revision 3aaec5d2 - 06/19/2016 05:58 PM - J. Moringen

Turned parallel iterators into structures in src/view/serialized.lisp

refs #2572

- src/view/serialized.lisp (header): updated copyright
- (%iterator): new structure; state of an in-parallel steppable iterator
- (%iterator-step): adapted to changed iterator representation
- (%iterator-min): likewise
- (%iterator-for-forward-step): likewise
- (%iterator-for-backward-step): likewise
- (make-simple-sequence-iterator serialized): likewise
- (iterator-endp serialized serialized-iterator t t): likewise
- (iterator-element serialized-iterator serialized-iterator): likewise

##### Revision fd551245 - 06/19/2016 05:58 PM - J. Moringen

Reduced number of iterator comparisons in src/view/serialized.lisp

refs #2572

- src/view/serialized.lisp (%iterator<): renamed %iterator{-min -> <}; compare iterators instead of returning the minimum
- (%iterator-for-forward-step): removed; no longer needed
- (%iterator-for-backward-step): adapted to use `%iterator<' instead of `%iterator-min'
- (serialized-iterator::sorted): new sorted; heap of sorted iterators
- (shared-initialize :after serialized-iterator t): initialize heap of sorted iterators
- (iterator-step serialized serialized-iterator t): use top value of heap for forward step; reconstruct heap for backward step
- cl-rsbg.asd (system cl-rsbg): added system dependency on pileup

##### Revision 7dc5fc70 - 09/28/2017 07:38 PM - J. Moringen

fixes #2572

- src/channel.lisp (header): updated copyright
  - (channel-timestamps/raw channel): renamed channel-timestamps{ > /raw}; return uint64 timestamp sequence returned by backend
  - ~~(channel-timestamps channel): new method; wrap raw timestamp sequence in 'channel-timestamp' instance which translates elements to 'timestamp' instances~~
  - ~~(entry channel-timestamp): translate timestamp to uint64 before calling backend~~
  - ~~(self-entry t channel-timestamp): likewise~~
  - ~~(channel-timestamps): new class; transparently translates elements to 'timestamp' instances~~
  - ~~(length channel-timestamps): new method; return length~~
  - ~~(elt channel-timestamps integer): new method; return translated element~~
  - ~~(channel-items::channel): renamed reader (channel-items -> )%channel~~
  - (channel-items::timestamps): similar
  - (shared-initialize :after channel-items t): retrieve raw channel timestamps
  - (length channel-items): adapted to renamed reader
  - (elt channel-items): likewise; translate raw timestamp to 'timestamp' instance
- src/view/serialized.lisp (header): updated copyright
  - (make-serialized-view bag): default comparator is '<'
  - (make-serialized-view sequence): likewise
  - (%make-key-function channel): retrieve raw timestamp from channel
  - (%make-key-function channel-timestamp): new method; for 'channel-timestamps' class
  - (%make-key-function channel-items): adapted to renamed reader
  - (serialized::compare): changed initform to '<'
- src/backend/util.lisp (header): updated copyright
  - (uint64->timestamp): new function; moved here from src/backend/tidelog/util.lisp
  - (timestamp->uint64): likewise
- src/backend/package.lisp (package rsbag.backend): added exported symbols uint64->timestamp and timestamp->uint64
- src/backend/tidelog/util.lisp (uint64->timestamp): removed; moved to src/backend/util.lisp
  - (timestamp->uint64): likewise
- src/backend/tidelog/index.lisp (timestamps): changed documentation string w.r.t. representation of timestamps
  - (elt timestamps integer): do not translate timestamp
  - (index-timestamp->offset input-index integer): changed specializer 'timestamp' -> 'integer'
- src/backend/tidelog/file.lisp (header): updated copyright
  - (put-entry file integer integer simple-array): changed specializer 'timestamp' -> 'integer'; do not translate timestamp
- src/backend/elan/types.lisp (header): updated copyright
  - (timestamp/nanoseconds): new type; timestamp in nanoseconds

- (time-slot/cons): changed timestamp/{milliseconds -> nanoseconds}
- src/backend/elan/util.lisp (header): updated copyright
  - (milliseconds->nanoseconds): new function; conversion
  - (nanoseconds->milliseconds): likewise
  - (nanoseconds->timestamp): likewise
  - (timestamp->nanoseconds): likewise
  - (millisecs->timestamp): removed; no longer needed
  - (timestamp->millisecs): likewise
- src/backend/elan/xml.lisp (xml-> element eql time-slot/cons):
  - convert time value to nanoseconds
  - (->xml cons element eql time-slot/cons): corresponding
- src/backend/elan/file.lisp (shared-initialize :after file t):
  - convert base timestamp to nanoseconds when resolving time values
  - (close file): converter base timestamp from nanoseconds
  - (get-timestamps file integer): do not translate returned timestamps
  - (put-entry file integer integer string): changed specializer
  - `timestamp' -> `integer'; do not translate timestamp
- test/mock-backend.lisp (put-entry mock-backend integer integer t):
  - changed specializer timestamp -> integer
  - (simple-channels): generate uint64 timestamps
- test/builder.lisp (header): updated copyright
  - (replace-timestamps): new function; helper for
  - `check-un-build-calls'; replace `timestamp' instance with integers for comparison
  - (check-un-build-calls): use `replace-timestamps'
  - (test rsbag-builder-root::bag/smoke): changed timestamps in mock data from `timestamp' instances to integers; timestamp replacement for comparison
  - (test rsbag-builder-root::channel/smoke): likewise
- test/backend/tidelog/file.lisp
  - (test backend-tidelog-root::repeated-timestamp): changed timestamp from `timestamp' instance to integer

## Revision b34a5c7f - 09/28/2017 08:21 PM - J. Moringen

Mention record and replay efficiency improvements in news.rst

refs #2572

- news.rst (RSBag 0.17): mention more efficient recording and replay

## History

---

### #1 - 06/19/2016 06:00 PM - J. Moringen

- % Done changed from 0 to 70

Next up: make timestamp comparisons cheaper (even though we have much fewer already)

### #2 - 11/07/2016 10:40 AM - J. Moringen

- Target version changed from rsb-0.15 to rsb-0.16

**#3 - 04/10/2017 09:01 PM - J. Moringen**

- *Target version changed from rsb-0.16 to rsb-0.17*

**#4 - 09/28/2017 08:10 PM - J. Moringen**

- *Status changed from In Progress to Resolved*

- *% Done changed from 70 to 100*

Applied in changeset commit:rsbag-cl|7dc5fc704035ae61d7fbf45c27be63b46e4a4391.