

# Grouper messaging built in

|                           |                                               |                                |                                          |                                         |                                              |
|---------------------------|-----------------------------------------------|--------------------------------|------------------------------------------|-----------------------------------------|----------------------------------------------|
| <a href="#">Wiki Home</a> | <a href="#">Grouper Release Announcements</a> | <a href="#">Grouper Guides</a> | <a href="#">Grouper Deployment Guide</a> | <a href="#">Community Contributions</a> | <a href="#">Internal Developer Resources</a> |
|---------------------------|-----------------------------------------------|--------------------------------|------------------------------------------|-----------------------------------------|----------------------------------------------|

Grouper has a built in messaging system which is not as robust as a messaging middleware product such as ActiveMQ or RabbitMQ.

A message is just a record in a database table which has a timestamp (which determines the ordering), and other fields.

A sender can send to a queue or a topic. A queue has a receiver pulling messages. A topic will just distribute to 1 or more queues.

Receivers need to receive the message then mark it as processed when done.

Message table: grouper\_message: If using the default internal messaging with Grouper, this is the table that holds the messages and state of messages



See [Grouper Messaging System Developers Guide](#) for info on how to integrate the Grouper Messaging System with another messaging system.

[GSH to manage built in messaging](#)

[GSH to send / receive messages](#)

## Setup queues

- Queues can be sent to directly or from topics
- A queue shouldnt have the same name as a topic.
- There is a built in folder for queues in grouper: <ATTRIBUTE\_ROOT\_STEM\_CONFIGURED\_NAME>:grouperMessageQueues.
- A queue is a permission resource in that folder of attributeDef <ATTRIBUTE\_ROOT\_STEM\_CONFIGURED\_NAME>:messages: grouperMessageQueueDef
- The action to send to a topic is "send\_to\_queue", grant that to a subject who is allowed to send messages to the queue
- The action to receive from a queue is "receive", grant that to a subject who is allowed to pull messages off the queue

```
grouperSession = GrouperSession.startRootSession();

GrouperBuiltinMessagingSystem.createQueue("abc");
GrouperBuiltinMessagingSystem.deleteQueue("abc");

// permissions on objects
GrouperBuiltinMessagingSystem.allowSendToQueue("abc", SubjectTestHelper.SUBJ0);
GrouperBuiltinMessagingSystem.allowReceiveFromQueue("abc", SubjectTestHelper.SUBJ0);
GrouperBuiltinMessagingSystem.disallowSendToQueue("abc", SubjectTestHelper.SUBJ0);
GrouperBuiltinMessagingSystem.disallowReceiveFromQueue("abc", SubjectTestHelper.SUBJ0);
```

## Setup topics

- There is a built in folder for topics in grouper: <ATTRIBUTE\_ROOT\_STEM\_CONFIGURED\_NAME>:grouperMessageTopics.
- A topic is a permission resource in that folder of attributeDef <ATTRIBUTE\_ROOT\_STEM\_CONFIGURED\_NAME>:messages: grouperMessageTopicDef
- The action to send to a topic is "send\_to\_topic", grant that to a subject who is allowed to send messages to the topic
- You cannot read from a topic, the topic will send to queues, and you can grant that on queues
- To setup the relationship between a topic and queue(s), setup a permission resource implied relationship between the topic and the queues

```

grouperSession = GrouperSession.startRootSession();

GrouperBuiltinMessagingSystem.createTopic("def");
GrouperBuiltinMessagingSystem.deleteTopic("def");

// permissions on objects
GrouperBuiltinMessagingSystem.allowSendToTopic("abc", SubjectTestHelper.SUBJ0);
GrouperBuiltinMessagingSystem.disallowSendToTopic("abc", SubjectTestHelper.SUBJ0);

// topics send to queues
GrouperBuiltinMessagingSystem.topicAddSendToQueue("def", "abc");
Collection<String> queues = GrouperBuiltinMessagingSystem.queuesTopicSendsTo("def");
GrouperBuiltinMessagingSystem.topicRemoveSendToQueue("def", "abc");

```

## Performance

- This system (with local HSQL database) can process (send / receive / acknowledge)
  - 125 messages per second in one thread
  - 312 messages per second in 10 threads

## Message columns

| Column name                 | Description                                                                                                                                                                  | Index | Foreign key                        |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------|
| ID                          | db uuid for this row                                                                                                                                                         |       |                                    |
| HIBERNATE_VERSION_NUMBER    | incrementing number so two updates dont occur at once (optimistic locking)                                                                                                   |       |                                    |
| SENT_TIME_MICROS            | microseconds since 1970 this message was sent (note this is unique for one jvm, this is probably unique across jvms, but not necessarily)                                    |       |                                    |
| GET_ATTEMPT_TIME_MILLIS     | milliseconds that the message was attempted to be received. If the message is not confirmed in a certain amount of time, the state will be set back to IN_QUEUE to try again |       |                                    |
| GET_ATTEMPT_COUNT           | how many times this message has been attempted to be retrieved                                                                                                               |       |                                    |
| STATE                       | state of this message: IN_QUEUE, GET_ATTEMPTED, PROCESSED                                                                                                                    |       |                                    |
| GET_TIME_MILLIS             | millis since 1970 that this message was successfully received                                                                                                                |       |                                    |
| FROM_MEMBER_ID              | member id of user who sent the message                                                                                                                                       |       | foreign key to grouper_member.s.id |
| QUEUE_NAME                  | queue name for the message that it is delivered to (note, topics can send to multiple queues, which will duplicate the message)                                              |       |                                    |
| MESSAGE_BODY                | message body                                                                                                                                                                 |       |                                    |
| ATTEMPT_TIME_EXPIRES_MILLIS | millis since 1970 that this attempt will expire before it is acknowledged. After it expires it will be delivered again when receive() is called                              |       |                                    |

### See Also:

[Grouper Messaging System](#)

[Message Format Detail](#)

[Message Format Config Example](#)

[Grouper Messaging System Development Guide](#)