QuviQ

Quviq Licences: Users' Guide

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Introduction

Quviq licences enable a *group* of users to share access to a single QuickCheck group licence. Each group is managed by an *administrator*, who adds individual users to the group. The first step is for the administrator to create registrations for individual users: to do this, read the section "For Administrators" of this user guide. If you are a QuickCheck user, and you have received a registration identifier from your administrator, then you should read, and follow the instructions in, the next part of this user guide "For Users".

For Users: Installing, Licencing and Using QuickCheck

Make sure the right version of QuickCheck is installed

The first step is to make sure the code of QuickCheck is installed correctly. Start an Erlang shell, and type the command

```
eqc:version().
```

If QuickCheck is installed, the result will be the version number of the installed copy. **This documentation applies only to version 1.14 or later.** If you see an undefined function exception, or if the version number is earlier than 1.14, then you must obtain and install the latest version of QuickCheck before you can proceed—otherwise you can skip this step.

How to install the code of QuickCheck

QuickCheck is delivered as a folder/directory with a name of the form eqc-x.xx (for example, eqc-1.14), containing subdirectories ebin (with the code itself), include (header files needed to use QuickCheck), and doc (html documentation). To install QuickCheck, it is only necessary to copy this folder into the lib directory of your Erlang installation (which under Windows might for example be C:\Program Files\erl5.6.4\lib). Once QuickCheck is placed in the correct location, then you should be able to start a new Erlang shell and call eqc:version() as above. Why not bookmark doc/index.html in your browser too, so that you can easily refer to the QuickCheck documentation in the future?

How to install the Emacs mode for QuickCheck

QuickCheck is delivered together with an emacs mode that provides templates for many of the QuickCheck constructs. The simplest way to install this mode is to type

```
eqc_emacs_mode:install().
```

in the Erlang shell. This tries to find your .emacs file and add commands to load the QuickCheck mode. If it fails to find your .emacs file automatically, then you can supply the location explicitly by calling

```
eqc_emacs_mode:install(PathToDotEmacsFile).
```

Cygwin users: you cannot use the same .emacs file under both Cygwin and native Windows, because the path from which the QuickCheck mode is loaded differs between the two.

How to install a registration identifier

In order to use QuickCheck, you will need a 12-character registration identifier which uniquely identifies your installation. You can obtain such an identifier from the administrator of your group licence. Ask your administrator to create a user licence for you. When this has been done, you will receive an email from Quviq containing your registration identifier, for example XLSNofMecaDE.

To install your registration identifier, start an Erlang shell and type

```
eqc:registration("xxxxxxxxxxxx").
```

where "xxxxxxxxxxxx" is the registration identifier Quviq provided you with. QuickCheck will create a directory called .quviq2 in your home directory, containing your licence files. Once this is done, you

are ready to use QuickCheck. You can use this licence on any computer that shares the same home directory.

You need not keep the registration identifier once you have installed it, because it can only be used once. If you want to use QuickCheck under two different user identifiers, then you will need to ask your adminisator to create a new user licence for you.

Caution: don't attempt to read or write the Quviq licence files using any software other than QuickCheck—doing so risks corrupting the licence.

How to connect to Quviq's licence server

In order to verify your licence, QuickCheck needs to be able to connect to Quviq's server. The connection is made on port 80 using http, so if you can browse the web, then QuickCheck should be able to connect to our server. If you connect to the internet through a proxy, then you will need to set the HTTP_PROXY environment variable to tell QuickCheck how to find it. Once your proxy settings are correct, you should be able to start QuickCheck by calling

```
eqc:start().
```

QuickCheck will contact Quviq's server, reserve a licence for your use, and start. If it reports that it cannot contact Quviq's server, then you probably need to set HTTP_PROXY.

Connecting via a proxy

If you connect to the internet via a proxy, then you should set the operating system environment variable EQC_PROXY to one of the following forms. If EQC_PROXY is not set, QuickCheck will read the variable HTTP_PROXY instead.

Form	Example	Explanation
http://<server>	http://proxy.company.com	The URL of a proxy you connect to on port 8080
http://<server>:<port>	http://proxy.company.com:8020	The URL of a proxy you connect to on a different port
http://<user>:<password>@<server>	http://john:kjkhgh@proxy.company.com	A URL containing username and password for an authenticated proxy
http://<user>:<password>@<server>:<port>	…	A URL for an authenticated proxy using another port

You are now ready to use QuickCheck. However, in the rest of this section you will find some useful refinements.

Refinements

Using QuickCheck without an internet connection

If you want to use QuickCheck without an internet connection—for example, on a laptop while you are travelling—then you can *reserve* a licence for your use. You can reserve a licence for any period from one hour to seven days. Internet access is needed to make a reservation, but once it has been made, then QuickCheck can be used without internet access until the reservation expires. However, during this period no other user can use the same licence, so make long reservations with consideration.

To reserve a licence for N hours, call

```
eqc:reserve({N,hours}).
```

To reserve a licence for N days, call

```
eqc:reserve({N,days}).
```

Using QuickCheck in an automated test suite

If you plan to use QuickCheck in an automated test suite, for example a Common Test suite, then you should make sure that you call eqc:start() at the beginning of the test suite (for example, in init_per_suite), and eqc:stop() at the end. Otherwise, QuickCheck may be started (and thus perform a licence check) in every test case, which can be quite expensive. Calling eqc:stop() terminates QuickCheck cleanly—otherwise the next call of eqc:start() may fail, since QuickCheck seems already to be running.

You can prevent QuickCheck from trying to refresh your licence during the automated tests, by calling eqc:reserve before you start testing, to reserve a licence for sufficient time for all of the tests to finish.

Tuning the licence check

When QuickCheck is started, it reserves a licence for the next hour. Thereafter, QuickCheck renews the reservation periodically to maintain an active session. By default, QuickCheck reserves the licence for the next ten minutes each time, which allows another user to take over the licence fairly quickly when you are finished using QuickCheck. However, you may wish to extend this period:

- If you are using a *fixed* licence, which is dedicated to your use, or
- To reduce the computational and communication overhead of the licence check, or
- To ensure you don't lose the licence to another user because of a short period of inactivity, or
- To tolerate a poor internet connection, which is causing some renewal attempts to fail.

You can set the environment variable EQC_RESERVATION to the number of minutes that QuickCheck should reserve at each renewal. Any value in the range 10 to 1440 (24 hours) is acceptable, with 10 giving the default behavior. QuickCheck will start trying to renew your session once half of your reservation has been used.

Using multiple licences

You can use eqc:registration to install registration identifiers for more than one QuickCheck licence at the same time. If you do this, then you must specify which of these licences you want to use. You can do so by creating a file .eqc_licence containing the name of the chosen licence, or a list of licence names, one per line, which QuickCheck will try to use in sequence. This file can be placed in your home directory, or in the directory in which you are running QuickCheck, or in any of its ancestor directories. A local .eqc_licence file takes preference over the one in your home directory.

Example: a development project for a customer

Suppose your own QuickCheck licence is called A, but you are developing code for a customer who has their own licence, called B. When testing the customer's code you should use their licence, while for other projects you should use your own. Place one .eqc_licence file in your home directory containing A, and another in the directory above the customer's code containing B; now QuickCheck will automatically choose the right licence—when you, or anyone else, runs QuickCheck in the directory containing the customer's code, then the customer's licence will be used.

If the customer's code is stored in a shared repository, then you can add the .eqc_licence file to the root directory of the project repository, thus ensuring that anyone who checks out the code will also use the correct licence.

Of course, developers must still register as users of the customer's licence—otherwise QuickCheck will warn that they are not registered to use the specified licence, and fail to start.

If you want to use the customer's licence *if available*, but use your own licence if all customer licences are in use, then you can place

```
B
A?
```

in the project-specific .eqc_licence file. In this case, anyone testing the customer's code will first try the customer's licence, but if QuickCheck fails to start using this licence, will fail over to your own. Any of your developers who have not registered to use licence B will use licence A instead, but will be warned of the missing registration—so they will know they should register to use the customer licence instead.

You can also share this file with the customer. The customer's own developers, who are only registered to use licence B, *will* be able to run QuickCheck using their own licence, but *will not* be able to fail over to your licence A (because they are not registered to use it). The effect of the question mark in the file above is to disable warnings about licence A—so that the customer's developers are not troubled by warnings that they are not registered to use your licence.

If you want to use the customer's licence only if all of your own are in use, you just reverse the two lines in .eqc_licence:

```
A?
B
```

Now your own licence is used, if the developer is registered to use it and there is a licence available, and the customer's licence is used otherwise. As before, warnings are generated for developers who

are not registered to use the customer licence B, but no warnings are generated about your licence A.

You can find out which licences are installed by calling

```
eqc:licences_installed().
```

Troubleshooting

When I tried to start QuickCheck, it failed with a message containing 'all_licences_in_use'.

Your group licence is already being used by the maximum number of users. You will need to wait until one of the currently active users stops using QuickCheck, so that a licence becomes free. The message also contains a list of the currently active users, together with how long each user has reserved their licence for. The earliest time a licence will become free is when the shortest reservation runs out.

To avoid blocking a licence unnecessarily, make sure that you call eqc:stop(), or terminate your Erlang shell, when you have finished using QuickCheck.

I encountered a 'licence_apparently_copied' exception, and now I cannot start QuickCheck.

This exception is generated when QuickCheck believes that the licence files of one installation have been copied to another. It could, for example, be triggered if a backup of the licence files is restored. It should never happen in normal use; if it does, please let us know, in as much detail as possible, what led up to the problem. Once the exception has been generated, then the licence is corrupted. You will need to ask your licence administrator to reset your licence, and reinstall it using eqc:registration.

How can I replace my registration identifier with a new one?

If your administrator provides you with a new registration identifier, you can install it as follows. Make sure that QuickCheck is not running, then call

```
eqc:registration("xxxxxxxxxxxx").
```

where "xxxxxxxxxxxx" is the new identifier. Next time you start QuickCheck, it will use the new licence.

QuickCheck crashed, with a message "QuickCheck terminated by restart"

Each licenced user can run only one copy of QuickCheck, so if QuickCheck finds that another copy has been started, then it exits with this message.

QuickCheck exits with a 'tamperproof_seal_broken' error

This means that the run-time environment in which you are trying to start QuickCheck differs from the environment in which the licence file was created. For example, if you create a licence file under Linux, and then try to use the same licence file under Windows, then you will encounter this error. When this occurs, QuickCheck saves diagnostic information in a file called tamperfree_diagnosis.qvq. Please send this file to support@quviq.com for diagnosis.

I want to run QuickCheck on several computers at the same time; how can I do this?

You will need to use one licence for each computer running QuickCheck. However, each licenced installation can run only one copy of QuickCheck at a time, so you will need to run each copy of QuickCheck under a different user identifier, and obtain a separate QuickCheck registration identifier for each one.

For Administrators: how to manage a Quviq group licence

A Quviq licence for N users entitles up to N group members to use QuickCheck simultaneously. As the administrator of the group, you can add and remove members, and view usage information for each user and for the group as a whole. Quviq licences take two forms: *floating* licences allow any number of members in the group, provided no more than N members use QuickCheck at the same time, while *fixed* licences also restrict the number of group members to N. In the documentation below,

- text which applies only to floating licences appears on an orange background,
- and text which applies only to fixed licences appears on a green background.

Starting the licence administration interface

When your licence is created, you will receive an email from Quviq containing a URL for administering your group, a username, and a password. This URL contains a 12-character key that identifies your group licence uniquely. You should keep this key secret, since anyone possessing it will have complete control of your licence. Clicking on the URL (and supplying the username and password if necessary) will log you in to Quviq's licence administration web server. You will see a page offering a menu of choices, including creating a user licence, viewing users, and displaying statistics.

Creating a user licence

To enable users to start using QuickCheck, you will need to create a user licence for each one. Click on the "Create a user licence" link to do so. You will be asked to supply the user's name and email address; when you click on the "Save" button then a registration identifier is created for that user, and an email is sent from Quviq's server telling them how to install it. Once the user follows the instructions in that email, then they become a part of your group and can begin using your group licence.

If you have a floating licence, then you can create as many users as you like—even several for the same person. It can be useful to give the licences names such as "John Hughes", "John Hughes laptop", "John Hughes at home" so that you can later tell which licences are in use.

If you have a fixed licence, then you can create as many users as you have a licence for. Once you reach this limit, then you will need to delete a user before adding a new one.

Viewing the users in the group

You can view all the users in the group by following the "View/Edit users" link. A table is displayed showing all the registered users and their status. You can see:

- Who is currently using QuickCheck—and how long remains until their session will expire.
- Whether any users have reserved licences for long periods (for example, for use on a trip without an internet connection).
- How much each user has used QuickCheck (both in hours and in number of sessions).
- The date of last use for each user.
- Which *version* of the client each user is using. All group members are entitled to use the latest version your group licence covers, so you might encourage users with older versions to upgrade their client.

Modifying a user licence

You can modify a user licence by clicking on the "Control" button by the user's entry in the table discussed above. Several options are available.

Updating the username and email address

You can edit the username and email address and use the "Save" button to update them.

Notify the user of his registration identifier

You can resend a user his or her registration identifier by clicking the "Notify" button. An email is sent to the user from Quviq's server, containing the registration identifier and instructions on installing it. This is primarily useful when the original email message sent from Quviq's server has been lost, without the licence being installed.

Reset a user licence

If a user's licence file is corrupted, then you can *reset* the licence by clicking the "Reset" button. This allows the user to create a new licence file with the *same* licence identifier (and preserves the usage information for that user). An email is automatically sent to the user with instructions on how to recreate their licence file. Licences cannot be reset while they are active.

If you have a fixed licence, then user licences can be reset at the earliest 30 days after they were added to the group, or after the last reset.

Deleting a user from the group

A deleted user will no longer be able to use your group licence. Since licences can be used from anywhere on the internet, then it is a good idea to delete users who should no longer have access to your licence. Users cannot be deleted while their licence is active.

If you have a fixed licence, then users can be deleted at the earliest 30 days after they were added to the group, or their licence was last reset. Thus, with a fixed licence, you can replace one user by another every 30 days.

Viewing usage statistics

Following the "Statistics" link on the first page displays a summary of QuickCheck usage over the past two weeks. For each day, you can see the total time in QuickCheck sessions (summed over all users), the number of people who used QuickCheck on that day, the maximum number of simultaneous users, and the number of times a user was "denied"—that is, was unable to start QuickCheck, because all the available licences were already in use. If denials are frequent, then you should consider either scheduling QuickCheck use more efficiently, or purchasing additional licences.