

Installation and administration of EMERGO

Open Universiteit in the Netherlands

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1. Summary

We describe how EMERGO can be installed on a server of an (education) institution, how an administrator can add users to EMERGO, how an administrator can define runs of EMERGO cases and how an administrator can support users when they are stuck.

EMERGO is an Open Source product, so can be used by everyone.

The installation of EMERGO is discussed in Section 2 "System requirements for server" and Section 4 "Installation". The hardware must meet certain requirements. Furthermore, some open source packages are installed, and at last EMERGO itself.

Testing the installation of EMERGO is discussed in section 5 "Test installation". For this you also need Section 3 "System requirements for client". A test case is included within the installation package of EMERGO to be able to do the test.

Managing users is discussed in Section 6 "User management". This concerns everyone who has access to the EMERGO environment.

Managing runs is discussed in section 7 "Run management". EMERGO users with the role "tutor" or "student" can be assigned to case runs.

User support is discussed in Section 8 "User support". For this you also need Section 3 "System requirements for client". The progress status of users with the role "student" can be adjusted, for instance as they are stuck in a case run.

Within this document the "manager" and "case run manager" roles are discussed. The other three roles, "case developer", "tutor" and "student" are outside the scope of this manual and are addressed by other manuals.

2. System requirements for server

2.1. hardware

The EMERGO web server and database server have been tested on a Windows 2003 server with two Intel Xeon processors with a speed of 2.67 GHz and with 2 GB of internal memory. These are the (minimal) requirements for a server. The installation of the necessary software (Java + MySQL + Tomcat + EMERGO without case content) requires a hard disk storage space of around 300 MB.

During tests several dozen users worked with EMERGO, divided into three cases. If users had an internet connection of minimal 3 Mb/s, delays in the loading of new information in the browser were limited to a few seconds. Additional tests show no noticeable increase in delay for 10 times as many users and cases on a similar system.

2.2. software

EMERGO basically works on all operating systems on which a server can be installed that supports JAVA. We have tested the application in a Windows Server 2003 environment, and for instance not on Linux.

For setting up the EMERGO server we exclusively used Open Source, Freeware software. You will need to install this software before EMERGO can be installed.

The following description of software packages is based on an installation on a Windows operating system. If you want to install EMERGO on a different operating system such as Linux, you will have to get the necessary documentation yourself.

2.2.1 software required to use EMERGO

To use EMERGO, you need several open source packages. The following list shows these packages and which version is used at the time of writing of this document.

Java Runtime Environment JRE version 7 update 11

This Java environment is required when using the Apache Tomcat Web server (the used Tomcat version requires Java 5.0 or later). The JRE contains Java class libraries used by applications written in Java.

The Java Runtime Environment can be downloaded from various websites. It is also part of the Java Development Kit (JDK). We have used the Java Standard Edition Development Kit JDK 7 update 11. You can get it, or a later version, from:

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

Installation instructions can be found at:

<http://docs.oracle.com/javase/7/docs/webnotes/install/index.html>

It is advisable to use the last update because security holes are regularly discovered and fixed.

Take note of identified problems per version.

When installing the JDK, you must indicate that, in addition to the JDK itself (which also contains a private JRE environment), the public JRE environment must be installed.

After installation, make sure you add the path to the "bin" sub map of the JRE installation (eg "C:\Program Files\Java\jre\bin") to the Windows system variable PATH. If you don't do this, the Tomcat Web service probably will not start because the starting procedure cannot find critical files.

- *Apache Tomcat version 6.0.20*

The file jakarta-tomcat-6.0.20.exe is used for the installation as a service under Windows.

The latest 6.0 version can be downloaded from:

<http://tomcat.apache.org/index.html>

Before you install Tomcat, you must install the Java Runtime Environment. When starting the Tomcat installation you choose for "custom" installation. You can now specify if you want Tomcat to start as a Windows service when you start the computer. Also you can improve performance and scalability of your applications if you choose to install the "native.dll" file. Further the installation asks for the port number for the Tomcat server. If you don't have a Windows server running IIS, you better replace the default value of 8080 by 80. Then you don't have to add this port number to the URL of your EMERGO website. You must also enter an Administrator account. The Tomcat installation automatically finds the path to the already installed JRE environment. You can change the path if you have multiple versions of the JRE environment, and you want to use another version than the standard version. Finally, you can actually start the Tomcat server.

If you install Tomcat on Windows Vista the service may not start because it lacks sufficient rights. This can be fixed for instance by turning user management off (in the control panel under user accounts).

Furthermore, we recommend an increase of the memory Tomcat reserves for Java components. So there will be less risk on a server crash due to insufficient memory. You can configure this using the Tomcat monitor "Java" tab. In our test system using 2 GB of memory, we used the following settings:

- Initial memory pool: 256 MB
- Maximum memory pool: 1024 MB
- Thread stack size: 512 kB

Of course the heavier the system is used, the more memory must be reserved. In our tests up to a dozen students simultaneously accessed the server.

- *MySQL version 5.1.30 community version*

MySQL is used as database system. You can download a version from:

<http://dev.mysql.com/downloads>

On this website you choose the MySQL Community Server version 5.1. At the end of the installation you will have the opportunity to configure your server. Choose "Detailed Configuration". It then starts a "wizard" in which you can specify your configuration. The following settings can be used if you expect heavy use of the server (several cases, large numbers of students). For server type you select "Server Machine". For database use you select "Multifunctional". Then choose a location for the InnoDB tables, and choose for the number of simultaneous connections the "Online Transaction Processing (OLTP)" variant. Make "TCP/IP Networking" possible, and put the server in "Strict Mode". As default "character set" you may choose "Best Support For Multilingualism". You are free to make the server a Windows service that starts automatically at system startup. Use the

command prompt to communicate with the server, and then you can make the "bin" folder universally accessible through the Windows PATH variable. Create a "root" password. The root does not need to be accessible from other machines (unless you want to manage the server remotely). An anonymous account is not necessary.

If you have set this up, the installation will proceed further by creating a configuration file and starting the service. It may be that a firewall blocks access to the selected MySQL port (default ITP port 3306). You will get an alert, and you will have to adjust your firewall configuration.

In the above MySQL site, you can also download so called GUI Tools. These can be used later (see Section 4.1) to create an empty EMERGO database on your server. You then don't need to use the command prompt, but can use a graphical interaction when creating the EMERGO database file and setting parameters. You can also use the GUI tools or MySQL Workbench to manage your MySQL server. You can customize the configuration of your server, you can start and stop the server, you can monitor server activity, you can easily modify database tables, etcetera. We have used GUI Tools version 5.0-r17.

If you want to use another database system than MySQL you need to find out yourself how to adjust the EMERGO installation. In any case you must fill in the configuration information of your database system within the file "applicationContext-db.xml" (within the "WEB-INF" map). And you will have to add your own database connector file to the program library (within the "WEB-INF\lib" map).

3. System requirements for client

These are the requirements for a PC using EMERGO. They are also available on the EMERGO website.

3.1 Does your PC meet the minimum requirements?

Your pc must have enough memory to play video. On a Windows system this can be checked by:

- Click Start
- Click Control Panel
- (If necessary, click Performance and Maintenance)
- Click System
- Click General
- Look under computer, clock speed. The second value must be greater than 1 Gb

Further is needed:

- Windows XP, Vista or 7 operating system (MacOS and Linux can also be used, but this is not well tested.)
- Google Chrome, Firefox, Internet Explorer, Safari or Opera
- Adobe Flash version 9 or higher. If you don't have this program, download it from <http://get.adobe.com/flashplayer/>. The Flash Player is used to stream embedded video within the EMERGO player or to show it in a popup.
- Microsoft Word or WordPad (or Word Viewer for non-Windows systems) in order to read documents
- Powerpoint (or Powerpoint Viewer) to view PowerPoint presentations, this program is included in Microsoft Office
- Adobe Acrobat Reader for viewing PDFs. If you don't have it download it from <http://www.adobe.nl/>

- For non-Windows systems, the Windows Media Player plugin for viewing WMV video files. The last four requirements only apply if the case you go through uses these types of files.

3.2 Does your internet connection meet the minimum requirements?

Your internet download speed must be at least 3000 kbit (= 3MB) per second. You can test the download speed on the website: <http://www.speedtest.nl>. In the box 'Test uitvoeren' click on the 'Meet uw downloadsnelheid', and then click the 'Start de geselecteerde tests'. You find the download speed und 'Resultaat'. It must be higher than 3000 kbps.

3.3 Consequences of pressure data?

The data of EMERGO is stored on a server and not on the hard disk of your computer. The server regularly checks if your progress data is changed, and if so stores it on the server. Thus there is pressure of traffic especially when multiple people work simultaneously on the same server. Therefore you should keep in mind that sometimes it takes a while before you can see the system respond. This holds also if your system meets the requirements, so don't click too fast and wait for a response of the program.

3.4 Is your screen resolution ok?

You have to set your screen resolution to **at least** 1024 x 768, to prevent that a part of the EMERGO player falls out of your screen. In a Windows system this is adapted by:

- Click Start
- Click Control Panel
- (If necessary, click Appearance and Themes)
- Click Display
- Click Settings
- Adjust the resolution if necessary

4. Installation

You can download the zip file needed to install EMERGO in your server environment, from the EMERGO community website. To install EMERGO, use:

http://emergo.ou.nl/emergo/community/download/emergo_deploy.zip

In this section, we assume that you are using a Tomcat application server and a MySQL database server.

4.1 setup of the EMERGO database

Make sure the database server is started. We will explain how you work with the MySQL GUI tools. One of those tools is MySQL Administrator. Launch it and choose the "Create new schema" option. Enter name "emergo" and choose collation "latin1 – default collation". Create the schema.

4.2 installation of EMERGO using EMERGO zip file

- Stop Tomcat.
- Unpack the zip file within the map "webapps" of Tomcat. After unpacking be sure that the map "emergo" is a sub map of map "webapps".
- Now configure the EMERGO database connection, see "4.4.2 the applicationContext-db.xml file".
- Start Tomcat.
- Open <http://localhost:8080/emergo> (or <http://localhost/emergo> if Tomcat uses port 80) within the browser.
- When the logon screen is opened the database is filled initially automatically.

- Change language to "English" and Log on with userid "admin" and password "admin". You can change these values later on. See 6. User management.
- Choose role "administrator" and choose option "configure Emergo"
- Fill in mail server and no reply email address for alerts. For instance "mailserv.ou.nl" and "noreply@ou.nl".
- Optionally fill in a Google Maps key. This is only necessary if your EMERGO cases use the Google Maps component. You can get a key at <http://www.google.com/apis/maps/signup.html>

Now change the admin user id and password, and set the admin email address to be able to test email notifications (See 6. User management).

Installation is ready.

4.3 updating EMERGO using EMERGO zip file

Be sure your EMERGO sub map of the map "webapps" of Tomcat, is called "emergo"! You can rename the EMERGO sub map to "emergo" for this procedure to work and afterwards rename it back.

- Stop Tomcat.
- **Important!!** Save the "applicationContext-db.xml" file situated in map "WEB-INF" of the EMERGO installation, in a location outside the Tomcat map, because the new installation will overwrite it.
- Unpack the zip file within the map "webapps" of Tomcat. After unpacking be sure that the map "emergo" is a sub map of map "webapps".
- **Important!!** Copy the saved "applicationContext-db.xml" file back into map "WEB-INF".
- Start Tomcat. You'll find EMERGO version info at <http://localhost:8080/emergo/readme.html>.
- Open <http://localhost:8080/emergo> (or <http://localhost/emergo> if Tomcat uses port 80) within the browser.
- When the login screen is opened the database is updated automatically.

Update is ready.

4.4 configuration of EMERGO

4.4.1 the web.xml file

It contains a number of context parameters.

You should not change these parameters. Their values will apply to any server.

4.4.2 the applicationContext-db.xml file

This file is located in the subfolder "WEB-INF" of the EMERGO installation.

Within this file you configure the details of your database, such as database driver, database name, and identification and password of the user having access rights to the database server. EMERGO uses this data to exchange data between application and database server.

This file contains a so-called "bean" XML definition (see 2.2) with identification "Data Source". EMERGO used this definition (via the hibernate-library) to access the database server.

In this bean definition, the following properties are relevant to you (between brackets you see the value after installation of the EMERGO code):

- Driver Class Name [com.mysql.jdbc.Driver] Here you enter the path to the Java class that controls the database server. You can find this path by unpacking the database driver file, and to determine what is the path to the driver class. The value in the installation package belongs to the bundled MySQL driver. Normally you don't have to change this value.

- url [jdbc:mysql://localhost:3306/emergo] This is the url to the database. We assume a standard installation of MySQL, with access through port 3306, see section 2.2.1. Normally you don't have to change this value.
- username [] and password [] Fill in your username and password for MySQL, which you choose during installation of MySQL, see Section 2.2.1.

5. Test installation

A test case is included within the installation package of EMERGO. This allows you to test if EMERGO is installed and configured properly.

We assume Tomcat and MySQL are started on the server.

See Section 3 for system requirements for the client PC. You should check these before you proceed.

Take the following steps:

- Open the browser using the EMERGO url. This is eg <http://emergo.ou.nl/emergo>. If you test locally <http://localhost:8080/emergo>. The login screen should appear. [Otherwise Tomcat is not started.]
- Log on with your admin userid and password. Default these are resp. "admin" and "admin", but you may have changed it during the installation of EMERGO.
- Now a list of five EMERGO roles appears. [If not, MySQL server isn't started.] As admin you default have all roles. Choose the role "case developer".
- Then click the button "import ..." to import the "test case".
- Import file testcase.zip located in Tomcat map "webapps/emergo/testcase". Name it "test case" and click "ok".
- Click on button "case components" next to case "test case". You get an overview of all case components within it.
- Click on button "content" next to case component "navigation".
- Within the tree click on the "root" element and then on the "preview ..." option.
- Click on button "preview readonly".
- The EMERGO player is started. A flash video is started. [If not, the flash player is not installed on the client PC or you must install a newer version of it, see Section 3.1.]
- When the video is finished an alert appears. You should open the "resources" app on the tablet.
- Click the "tablet" button on the lower left part of the screen, and click on the "resources" app.
- Click on the first resource. A Pdf document is opened in a popup window. [If not, Adobe Acrobat Reader is not installed on the client PC, see Section 3.1.]
- Close the popup window.
- Click on the second resource. A Word document is downloaded or is opened in a popup window. [If not, Word or WordPad are not installed on the client PC, see Section 3.1.]
- Close the popup window close the "resources" app.
- Open the "email" app and click on the button "Make new e-message".
- Click on the text "test mail" and fill in a text message.
- Click on button "Add attachment" and locate an attachment on your client PC.
- If the attachment is added, click button "send". The sent mail appears in the folder "out".
- Open the sent mail and click on the attachment. Now the attachment should appear in a popup window.
- When sending the test mail an e-mail notification is sent to your e-mail address (because admin is tutor too). You should receive this e-mail in a short while. [If not, in the "smtpserver" or "no replay email address" are not set correctly, see Section 4.2. Or the firewall is not configured correctly, so the EMERGO server cannot contact the mail server.]

- Close the "email" app and open the "google maps" app. Google Maps should appear. [If not, you'll have to get a Google Maps key, see Section 4.2. That is if you expect the Google Maps component to be used within EMERGO.]

6. User management

Open the browser using the EMERGO url. Log on with your admin userid and password and select the role "administrator".

The administrator manages six types of data within EMERGO: configuration, accounts, components, cases, runs and contexts.

The first option is described in "4.2 installation of EMERGO using EMERGO zip file".

The third option is irrelevant, because it is only used when the EMERGO toolkit itself is being expanded or updated. This is beyond the scope of this manual.

The fourth option is meant to deactivate cases that are not used anymore. So case run managers will no longer be able to create a run based on such a case. Also case specific files can be uploaded. A case developer can refer to them using internal urls.

The fifth option is described in "8. User support".

The sixth option only is relevant if you want to integrate EMERGO with an existing LMS.

Choose the second option "manage accounts". You now first have the opportunity to filter on accounts' last names or user ids. After that, a table appears with all accounts matching the filter. Initially, you only see your own account. You can sort on eg "lastname" by clicking the column header.

6.1 Accounts

Accounts are users who have access to the EMERGO environment.

Click "new ...". A popup window appears.

Per account you can enter a number of data. Some data speak for themselves. Userid, password and last name are required.

The userid must be unique within EMERGO. Therefore it is useful to prefix an indication to the user id that for example depends on the (education) institution. For example "ou_" for students of the Open Universiteit in the Netherlands who will go on a case as part of their study. For users who only want to see a case as demo "demo_" or "visitor_" should do.

Within the field 'Initials' also a first name can be entered.

The email address is required for e-mail notifications. This only is relevant for accounts with the role "tutor". They will receive an email notification if a student sends an email within a certain case.

The checkbox "active" defines whether an account has access to EMERGO. If it is unchecked someone has no longer access to EMERGO, but everything he did within EMERGO is kept. In principle you'll never delete an account.

There are also five checkboxes, one for every EMERGO role, respectively: administrator, case developer, case run manager, tutor and student. An account can have multiple roles. A teacher can eg be case developer and tutor. A student usually will only have the EMERGO role "student", so you only check the corresponding checkbox.

You can also edit or delete accounts. Only delete one if you are sure that everything the account has done within EMERGO, can be deleted too.

7. Run management

Open the browser using the EMERGO url. Log on with your admin userid and password and select the role "case run manager".

A table appears showing all the runs the case run manager has defined. Initially it is empty.

7.1 Runs

The case run manager defined runs of cases and links accounts to the run, ie which EMERGO users are allowed to go on a case and when.

Click "new ...". A popup window appears.

Per run you can enter a number of data. Some data speak for themselves. Choice of a case and run name are required.

First, choose which case should run. Important to know is that for a run no copy of the case is made. This means that if a case is changed, these changes are immediately visible in all runs of the case. This has the important advantage that content and functional bugs can be solved during the run. No new run has to be started.

A "code" can be entered. This can be useful to add additional information on the run, for instance a course code.

For run name it is useful to include an indication about the period or duration of the run, eg "May 2013".

Default start date and time are equal to current date and time, meaning it will start immediately. From the moment start date and time are passed, the run can be chosen by a run member, ie he can run the case on which the run is based.

The end date is meant only as information to users, to indicate when they should have completed the case. Run members can still access the run after the end date.

The private checkbox indicates if student accounts will be assigned to a run by the case role manager or if all student accounts default have access to the run, so it is public. Private is default true. If private is false a case run manager still has to assign tutor accounts to a run, if applicable.

You can also edit or delete runs. Only delete a run if you are sure that everything run members have done within EMERGO, can be deleted, for instance for a test run.

7.2 Run members

When clicking on "participants" you get the opportunity to filter for an account's last name or user id. After that, a table appears of all accounts with the EMERGO-role "tutor" or "student" that match the entered filter. Only these two roles can participate in a casus run. You can sort on eg "name" by clicking the column header.

Each account has a checkbox to add or remove an account from a run. When the run is running, accounts can still be added.

If the account is unchecked, he no longer has access to the run, but his progress data still is saved.

7.3 Run teams

If a case developer has defined one or more components in which run members have to work in teams, next to "participants" is a button "teams".

When you click it a screen appears where you can add, change or delete teams. It is not advisable to delete teams from a running run.

For each team you can select team members using the button "team members".

7.4 Run team members

A table appears of all run members you previously have selected, see "Section 7.2".

You can check which run members should be team member. A run member can, in principle, be member of multiple teams, although this will usually not be the case. If a run member is member of multiple teams, then he must choose a team before he can start the EMERGO player. This only applies for the role "student".

8. User support

Open the browser using the EMERGO url. Log on with your admin userid and password and select the role "administrator".

Choose the fifth option "manage runs". A table appears with all runs defined by all case run managers within EMERGO. Initially, it is empty. You can sort on eg "name" by clicking the column header.

8.1 Run members

Using this option the administrator can help users with the EMERGO-role "student" that are stuck inside a case. By clicking "participants" a table with all participants of the run appears. For each participant progress information can be inspected or adjusted.

First of all, the administrator can click the button "open case". The case will be opened as if the administrator is the participant. The only difference is that progress is not saved, so the administrator can see where the student is stuck or what he has done so far.

The second option is meant to change a tag status. This means that the progress status of a particular element within the corresponding EMERGO case can be adjusted for this run member. For instance if a certain passage defined by the case developer remains closed (gray), the student cannot enter the corresponding room. Then, by using this option, the administrator can set the passage status to "to be opened". The edit dialog which appears is identical to the input dialog for an action within the script component, see the case developer manual of EMERGO (<http://www.emergo.cc/>). By means of a script action, status is adjusted too.

The third option is meant to change a component status. This means that the progress status of a particular component within the EMERGO case can be adjusted for this run member. For instance if a particular component remains "closed" so that it cannot be opened, the administrator can use this option to set the component to status "to be opened". The edit dialog which appears is identical to the input dialog for an action within the script component, see the case developer manual of EMERGO (<http://www.emergo.cc/>).

Using the fourth option "delete status", the complete progress status of a participant can be deleted. The participant has to start at the beginning of the case again. This option mainly is used to let someone who wants to demo a case, start all over again.