

**МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РФ**  
**Федеральное государственное автономное**  
**образовательное учреждение высшего образования**  
**«МОСКОВСКИЙ ПОЛИТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»**

**Лабораторная работа 4**  
**по дисциплине**  
**«Автоматизация процессов жизненного цикла программных средств»**

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## План выполнения лабораторной работы

### Ход работы

1. При помощи команды docker push собранный в ходе ЛР3 образ разрабатываемого приложения загрузить в Docker hub

Подключимся к Dockerhub:

```
zaa201-331@alicia:~$ sudo docker login -u photolife
[sudo] пароль для zaa201-331:
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

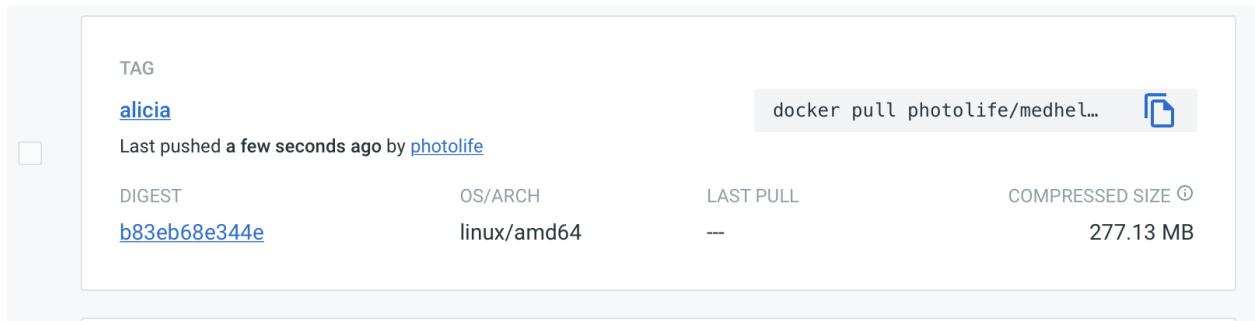
Выведем id наших контейнеров:

```
zaa201-331@alicia:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS
NAMES
ced38e03e8f7        server1            " ./server1"
5 seconds ago       Up 4 seconds
conds               romantic_pascal
afad02f7603a        keinos/sqlite3   "/bin/sh -c /usr/bin..."
2 days ago          Up 6 minutes
(healthy)           server-sqlite3-1
```

Выгрузим образ в репозиторий:

```
zaa201-331@alicia:~$ docker commit ced38e03e8f7 dockerid/myimage
sha256:3c4e3bc609ebe4322961f3f9e11b138e8557350a54c3f3bbd2d5c532b85424ec
zaa201-331@alicia:~$ docker tag sha256:3c4e3bc609ebe4322961f3f9e11b138e8557350a5
4c3f3bbd2d5c532b85424ec photolife/medhelper:alicia
zaa201-331@alicia:~$ sudo docker push photolife/medhelper:alicia
The push refers to repository [docker.io/photolife/medhelper]
a59b97d8e7b0: Pushed
5051b550aaad: Pushed
baa14f781dae: Pushed
8b759e8598cd: Pushed
69405a64c294: Pushed
a913f3c3e635: Pushed
dbf1b3208f7e: Pushed
08730ef8a78b: Pushed
9e259773ec5f: Pushed
b40ed86654e5: Layer already exists
alicia: digest: sha256:b83eb68e344ee653322b512cf87fba217fdecc93ecf65afea87a382e0
befc204 size: 2426
```

Образ успешно добавился:



2. Загрузить с Docker Hub образ jetbrains/teamcity-server и развернуть его согласно инструкции на странице образа

```
zaa201-331@alicia:~$ sudo docker pull jetbrains/teamcity-server
Using default tag: latest
latest: Pulling from jetbrains/teamcity-server
675920708c8b: Already exists
3a79233e0d0b: Pull complete
2e9ba879fec9: Pull complete
01e9be60e7da: Pull complete
8f4e4de36a80: Pull complete
cae37193de00: Pull complete
6a436565bbc: Pull complete
6eec893f30ab: Pull complete
506a63c95b35: Pull complete
8ff9a2434fe7: Pull complete
208c10710a56: Pull complete
4ad31a7b5776: Pull complete
Digest: sha256:2aac7a709c84a658d559d084311ecac7ab9d35fd778154cf4b21041e7000728c
Status: Downloaded newer image for jetbrains/teamcity-server:latest
docker.io/jetbrains/teamcity-server:latest
```

```
zaa201-331@alicia:~$ mkdir -p teamcity
zaa201-331@alicia:~$ mkdir teamcity/data
zaa201-331@alicia:~$ mkdir teamcity/logs
zaa201-331@alicia:~$ mkdir teamcity/agent
```

```
root@alicia:~# chown -R 1000:1000 /teamcity/data
root@alicia:~# chown -R 1000:1000 /teamcity/logs
```

```
root@alicia:~# sudo docker run --name teamcity-server-instance -v /teamcity/data:/data/teamcity_server/datadir -v /teamcity/logs:/opt/teamcity/logs -p 8111:8111 jetbrains/teamcity-server
/run-services.sh
/services/check-server-volumes.sh

/run-server.sh
TeamCity server.xml parameter: -config conf/server.xml
Java executable is found: '/opt/java/openjdk/bin/java'
2022-10-10 12:20:03 UTC: Starting TeamCity server
2022-10-10 12:20:03 UTC: TeamCity process PID is 134
NOTE: Picked up JDK_JAVA_OPTIONS: --add-opens jdk.management/com.sun.management.internal=ALL-UNNAMED -XX:+IgnoreUnrecognizedVMOptions --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.base/java.io=ALL-UNNAMED --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/java.util.concurrent=ALL-UNNAMED --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
10-Oct-2022 12:20:04.357 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version name: Apache Tomcat/8.5.78
10-Oct-2022 12:20:04.371 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server built: Mar 31 2022 16:05:28 UTC
10-Oct-2022 12:20:04.372 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version number: 8.5.78.0
[...]
10-Oct-2022 12:20:04.510 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-8111"]
10-Oct-2022 12:20:04.593 INFO [main] org.apache.catalina.startup.Catalina.load Initialization processed in 894 ms
10-Oct-2022 12:20:04.739 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service [Catalina]
10-Oct-2022 12:20:04.740 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet engine: [Apache Tomcat/8.5.78]
10-Oct-2022 12:20:04.765 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory [/opt/teamcity/webapps/ROOT]
Using logs directory "/opt/teamcity/logs"
Log4J configuration file /opt/teamcity/bin/../conf/teamcity-server-log4j.xml will be monitored with interval 10 seconds.
10-Oct-2022 12:20:13.100 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [/opt/teamcity/webapps/ROOT] has finished in [8,334] ms
10-Oct-2022 12:20:13.104 INFO [main] org.apache.coyote.AbstractProtocol.start Starting ProtocolHandler ["http-nio-8111"]
10-Oct-2022 12:20:13.139 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in 8545 ms
TeamCity version: 2022.04.4 (build 108763), data format version 980
OS: Linux, version 5.15.0-48-generic, amd64, Current user: tcuser, Time zone: GMT (UTC)
Java: 11.0.15, OpenJDK 64-Bit Server VM (11.0.15+9-LTS, mixed mode), OpenJDK Runtime Environment (11.0.15+9-LTS), Amazon.com Inc.; JVM parameters: --add-opens=jdk.management/com.sun.management.internal=ALL-UNNAMED -XX:+IgnoreUnrecognizedVMOptions --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.base/java.io=ALL-UNNAMED --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/java.util.concurrent=ALL-UNNAMED --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED -Djava.util.logging.config.file=/opt/teamcity/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djdk.tls.ephemeralDHKeySize=2048 -Djava.protocol.handler.pkgs=org.apache.catalina.webresources -Dorg.apache.catalina.security.SecurityListener.UMASK=0027 -Xmx2g -XX:ReservedCodeCacheSize=350m -Dteamcity.configuration.path=../conf/teamcity-startup.properties -Dlog4j2.configurationFile=file:/opt/teamcity/bin/../conf/teamcity-server-log4j.xml -Dteamcity_logs=/opt/teamcity/bin/../logs -Djava.awt.headless=true -Dignore.endorsed.dirs=-Dcatalina.base=/opt/teamcity -Dcatalina.home=/opt/teamcity -Djava.io.tmpdir=/opt/teamcity/temp
Startup confirmation is required. Open TeamCity web page in the browser. Server is running at http://localhost:8111
```

3. Открыть веб-интерфейс развернутого приложения, завести пользователя-администратора

The screenshot shows a web browser window with the URL `localhost:8111/mnt` in the address bar. The page title is "TeamCity First Start". At the top is the TeamCity logo (a stylized "TC" inside a blue hexagon). Below it is the heading "TeamCity First Start". A message says: "Please review the settings below before proceeding with the first TeamCity start." It explains that TeamCity stores configuration, project definitions, build results, and caches on disk in a Data Directory, located at `/data/teamcity_server/datadir`. If the user has already worked with TeamCity, they can choose to restore from backup or proceed directly. The footer indicates the version is TeamCity 2022.04.4 (build 108763).

The screenshot shows a web browser window with the URL `localhost:8111/mnt` in the address bar. The page title is "Database connection setup". At the top is the TeamCity logo. Below it is the heading "Database connection setup". A message states that TeamCity stores builds history and users-related data in an SQL database. A dropdown menu is set to "Internal (HSQLDB)". A note says: "The internal database suits evaluation purposes only and is not intended for production. We strongly recommend using an external database in a production environment." Another note says: "You can start with the internal database and then migrate the data to an external one after successful evaluation." A "Proceed" button is at the bottom right. The footer indicates the version is TeamCity 2022.04.4 (build 108763).



## TeamCity is starting

 Initializing TeamCity server components

This page will be reloaded automatically

TeamCity 2022.04.4 (build 108763)



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### 2. DEFINITIONS



## Create Administrator Account

Username

Password

Confirm password

[Create Account](#)

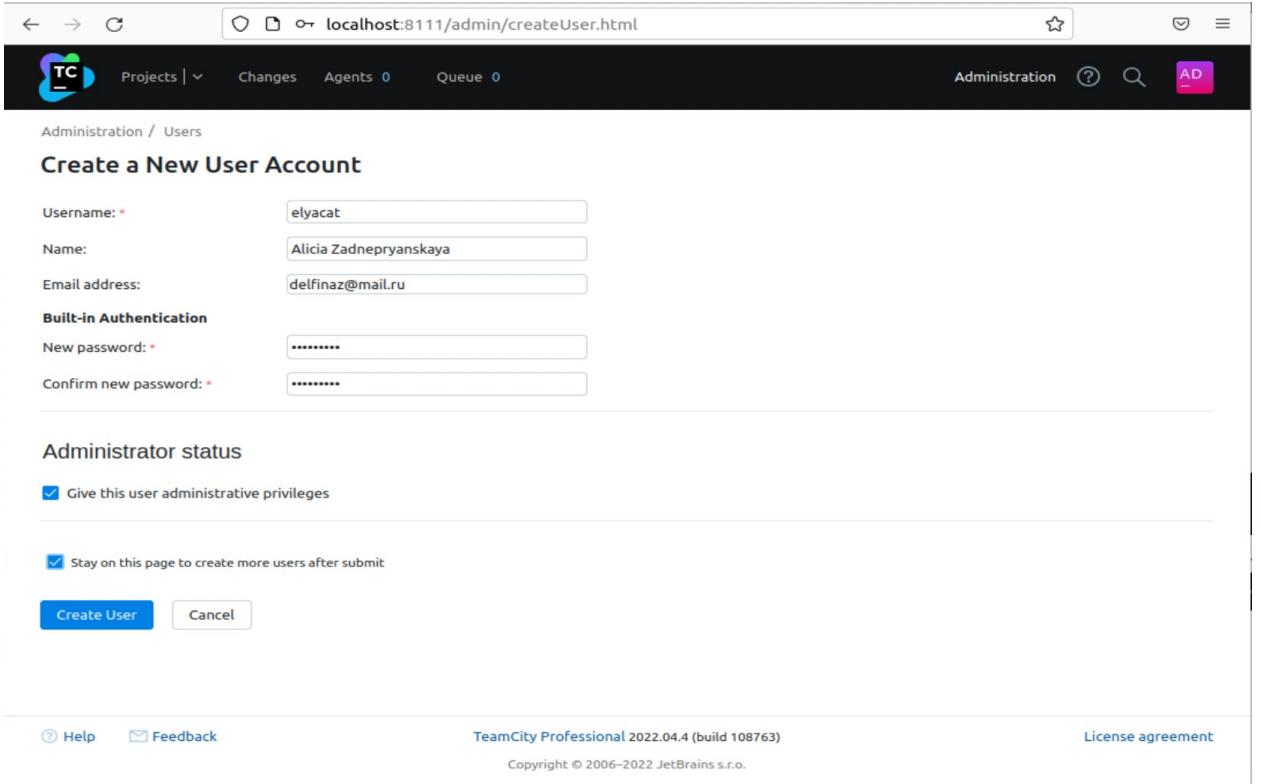
[Login as Super user](#)

Version 2022.04.4 (build 108763)

```
=====  
TeamCity initialized, server UUID: 57957a0f-bb4f-40e6-9b9f-ddcc29a25432, URL: http://localhost  
TeamCity is running in professional mode  
[TeamCity] Super user authentication token: 8581127123840454212 (use empty username with the token as the password to  
access the server)
```

The screenshot shows the TeamCity web interface. At the top, there is a terminal-like window displaying initialization logs. Below it is the main browser window. The browser title bar says "localhost:8111/overview.html". The page header includes the TeamCity logo, navigation links for "Projects", "Changes", "Agents 0", "Queue 0", and "Administration". A search bar and a license key indicator ("AD") are also present. The main content area is titled "Getting started with TeamCity" and contains a message stating "There are no projects in TeamCity. To start running builds, create projects and build configurations first." It features a "Create project" button and a "You may also want to:" section with links to "configure email settings", "manage licenses", and "add more users". At the bottom of the page, there are links for "Help", "Feedback", "TeamCity Professional 2022.04.4 (build 108763)", "Copyright © 2006–2022 JetBrains s.r.o.", and "License agreement".

4. В панели администрирования завести по одному пользователю для каждого члена команды



localhost:8111/admin/createUser.html

Administration / Users

### Create a New User Account

Username: \* elyacat

Name: Alicia Zadnepryanskaya

Email address: delfinaz@mail.ru

**Built-in Authentication**

New password: \* \*\*\*\*\*

Confirm new password: \* \*\*\*\*\*

**Administrator status**

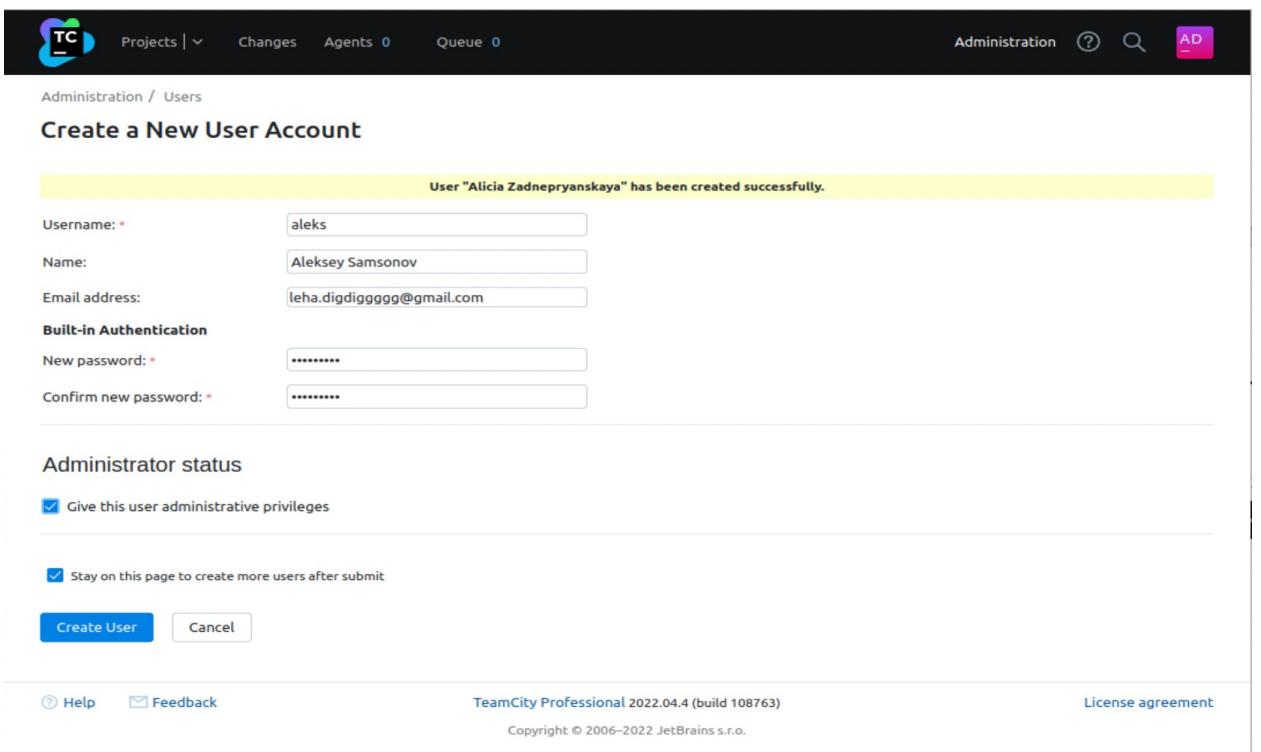
Give this user administrative privileges

Stay on this page to create more users after submit

**Create User** **Cancel**

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User "Alicia Zadnepryanskaya" has been created successfully.

Username: \* aleks

Name: Aleksey Samsonov

Email address: leha.digdigggg@gmail.com

**Built-in Authentication**

New password: \* \*\*\*\*\*

Confirm new password: \* \*\*\*\*\*

**Administrator status**

Give this user administrative privileges

Stay on this page to create more users after submit

**Create User** **Cancel**

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## Create a New User Account

User "Aleksey Samsonov" has been created successfully.

|                                |   |
|--------------------------------|---|
| Username: *                    | <input type="text" value="igorshurub"/>               |
| Name:                          | <input type="text" value="Igor Shurub"/>              |
| Email address:                 | <input type="text" value="zaza3000zaza3000@mail.ru"/> |
| <b>Built-in Authentication</b> |   |
| New password: *                | <input type="password" value="*****"/>                |
| Confirm new password: *        | <input type="password" value="*****"/>                |

### Administrator status

Give this user administrative privileges

Stay on this page to create more users after submit

**Create User**

**Cancel**

## Administration

### Project-related Settings

Projects

All Builds

Build Time

Disk Usage

Server Health

Audit

### User Management

**Users**

Groups

### Integrations

Tools

### Server Administration

Global Settings

Authentication

Updates

Nodes Configuration

Email Notifier

Diagnostics

Backup

Projects Import

Licenses

Clean-up Settings

## Users

User "Igor Shurub" has been created successfully.

Find users:  Filter Advanced search Users to show: 50

| <b>+ Create user account</b> | 4 users    |                        |                          |                                     |               |
|------------------------------|------------|------------------------|--------------------------|-------------------------------------|---------------|
|                              | Username   | Name                   | Email                    | Groups                              | Administrator |
| <input type="checkbox"/>     | admin      | N/A                    | N/A                      | <a href="#">View groups (1)   ▾</a> | Admin         |
| <input type="checkbox"/>     | aleks      | Aleksey Samsonov       | leha.digdigggg@gmail.com | <a href="#">View groups (1)   ▾</a> | Admin         |
| <input type="checkbox"/>     | elyacat    | Alicia Zadnepryanskaya | delfinaz@mail.ru         | <a href="#">View groups (1)   ▾</a> | Admin         |
| <input type="checkbox"/>     | igorshurub | Igor Shurub            | zaza3000zaza3000@mail.ru | <a href="#">View groups (1)   ▾</a> | Admin         |

5. Завести репозиторий в TeamCity, привязав репозиторий проекта

Administration / <Root project>

## Create Project

From a repository URL      Manually

**Parent project:** \* <Root project>

**Repository URL:** \*  A VCS repository URL. Supported formats: http(s)://, svn://, git://, etc. as well as URLs in Maven format. ⓘ

**Username:**  Provide a username if access to the repository requires authentication.

**Password / access token:**  Provide a password or a personal access token if access to the repository requires authentication.

**Proceed**

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Administration / <Root project>

## Create Project

From a repository URL      Manually

**Parent project:** \* <Root project>

**Repository URL:** \*  https://github.com/igorshurub/elya\_igor\_alex A VCS repository URL. Supported formats: http(s)://, svn://, git://, etc. as well as URLs in Maven format. ⓘ

**Username:**  Provide a username if access to the repository requires authentication.

**Password / access token:**  Provide a password or a personal access token if access to the repository requires authentication.

**Proceed**

Administration / **<Root project>**

## Create Project From URL

✓ The connection to the VCS repository has been verified

|  |   |
|--|---|
| <b>Project name:</b> *   | Elya Igor Alex  |
| <b>Build configuration name:</b> *   | Build   |
| <b>VCS root:</b>   | (Git) <a href="https://github.com/igorshurub/elya_igor_alex">https://github.com/igorshurub/elya_igor_alex</a> |
| <b>Default branch:</b> *   | refs/heads/main<br>The main branch or tag to be monitored   |
| <b>Branch specification:</b>   | Edit branch specification:<br>refs/heads/*  |
| <small>Branches to monitor besides the default one as a newline-delimited set of rules in the form of + -branch name with the optional * placeholder. Part matched by * (or part inside parentheses) will be shown as a build logical branch name.</small> |   |

**Proceed** **Cancel**

Administration / **<Root project>**

## **Elya Igor Alex**

**General Settings**
**Name:** \* Elya Igor Alex

**Project ID:** \* ElyalgorAlex
**Regenerate ID**

This ID is used in URLs, REST API, HTTP requests to the server, and configuration settings in the TeamCity Data Directory.

**Description:**

**Default template:** [\(?\)](#)
<No default template selected>

The template will be attached to all build configurations in this project and its subprojects unless redefined in a subproject.

[Show advanced options](#)

**Save** **Cancel**

**Build Configurations** (99 left)

Build configurations define how to retrieve and build sources of a project. [\(?\)](#)

[+ Create build configuration](#)

| Name  | Build Steps    |
|-------|----------------|
| Build | No build steps |

[Edit](#) [More](#)

Administration / **Elya Igor Alex**

**Build**

General Settings  
Version Control Settings 1  
**Build Steps**  
Triggers 1  
Suggestions 1  
Show more »

Created 2 minutes ago by admin (view history)

View as code

**Auto-detected Build Steps**  
Build steps and their settings are detected automatically by scanning VCS repository. You can [configure build steps manually](#) if auto-detect did not find relevant build steps.

No build steps found, [configure build steps manually](#).

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6. По выбору студента - либо из предложенных вариантов сборки, либо из реализованных студентом создать конфигурацию (последовательность шагов) для сборки разрабатываемого приложения в Docker образ и отправки его в Docker Hub

Administration / **Elya Igor Alex**

**Connections**  
Supported types of connections: Amazon ECR, Azure DevOps OAuth 2.0, Azure DevOps PAT, Bitbucket Cloud, Docker Registry, GitHub Enterprise, GitHub.com, GitLab CE/EE, GitLab.com, JetBrains Space, NPM Registry, Perforce Administrator Access, Slack.

+ Add Connection

General Settings  
VCS Roots 1  
Report Tabs  
Parameters  
**Connections**  
Shared Resources  
SSH Keys  
Meta-Runners  
Maven Settings  
Issue Trackers  
Cloud Profiles  
Clean-up Rules  
Versioned Settings  
Artifacts Storage  
NuGet Feed  
Suggestions 2  
« Hide unconfigured

Created one hour ago by admin (view history)

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localhost:8111/admin/editProject.html?projectId=ElyaIgorAlex&tab=oauthConnections#

Administration / <Root project>

## Elya Igor Alex

General Settings  
VCS Roots 1  
Report Tabs  
Parameters  
**Connections**  
Shared Resources  
SSH Keys  
Meta-Runners  
Maven Settings  
Issue Trackers  
Cloud Profiles  
Clean-up Rules  
Versioned Settings  
Artifacts Storage  
NuGet Feed  
Suggestions 2  
« Hide unconfigured

Created one hour ago by admin (view history)

Add Connection

Connection type: Docker Registry  
Display name: Docker Registry  
Registry address: https://docker.io  
Username:  
Password:

Save Cancel Test Connection

Actions Go to project page

Administration / <Root project> / Elya Igor Alex

## Build

General Settings  
Version Control Se...  
**Build Steps**  
Triggers 1  
Failure Conditions  
**Build Features**  
Dependencies  
Parameters  
Agent Requirements  
Suggestions 1  
« Hide unconfigured

Last edited 12 minutes ago by admin (view history)

Add Build Feature

Docker Support

Docker Support tracks pushed images and adds a dedicated tab with information about them [?](#)

On server clean-up, delete pushed Docker images from registry

Sign in to the following Docker registries before the build:  
To configure connections, use the [Project Connections](#) page

+ Add registry connection

| Name            | Parameters Description | Delete |
|-----------------|------------------------|--------|
| Docker Registry | https://docker.io      | Delete |

Save Cancel View as code [?](#)

Run ... Actions Go to build configuration page

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Administration / <Root project> / Elya Igor Alex

Run ... Actions Go to build configuration page

## Build

General Settings  
Version Control Settings 1  
**Build Steps**  
Triggers 1  
Failure Conditions  
Build Features 1  
Dependencies  
Parameters  
Agent Requirements  
Suggestions 1  
« Hide unconfigured

Last edited seconds ago by admin (view history)

View as code

**New Build Step**

Runner type: Docker  
Runner for Docker commands

Step name: Docker build  
Optional, specify to distinguish this build step from other steps.

Docker command:  build  push  other...

Docker Command Parameters

Dockerfile source: File

Path to file: \* Dockerfile  
The specified path should be relative to the checkout directory.

Context folder:

Image platform: <Any>  
Allows to choose compatible agents with a specific docker image OS platform.

Image name:tag photolife/medhelper:1.0%build.counter%  
Newline-separated list of the image name:tag(s).

Additional arguments for the command: -pull  
Additional arguments that will be passed to the docker command.

Show advanced options

Administration / <Root project> / Elya Igor Alex

Run ... Actions Go to build configuration page

## Build

General Settings  
Version Control Settings 1  
**Build Step: Docker**  
Triggers 1  
Failure Conditions  
Build Features 1  
Dependencies  
Parameters  
Agent Requirements  
Suggestions  
« Hide unconfigured

Last edited seconds ago by admin (view history)

View as code

**New Build Step**

Runner type: Docker  
Runner for Docker commands

Step name: Docker push  
Optional, specify to distinguish this build step from other steps.

Docker command:  build  push  other...

Docker Command Parameters

Remove image from agent after push  If selected, TeamCity will remove image with docker rmi at the end of the step

Image name:tag \* photolife/medhelper:1.0%build.counter%  
Newline-separated list of the image name:tag(s).

Additional arguments for the command: -pull  
Additional arguments that will be passed to the docker command.

Show advanced options

Save Cancel