psc_ TRANSITION TECHNOLOGIES

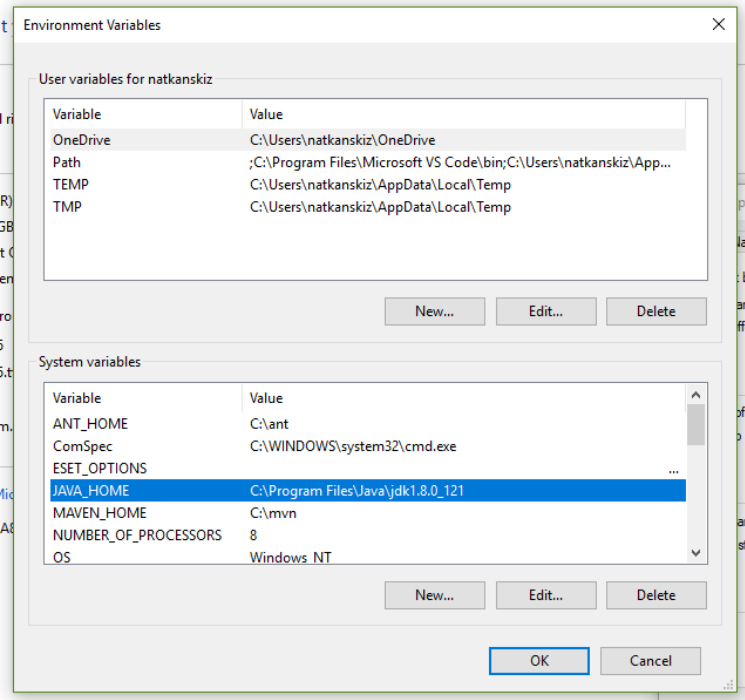
Narzędzia i technologie wspomagające programowanie

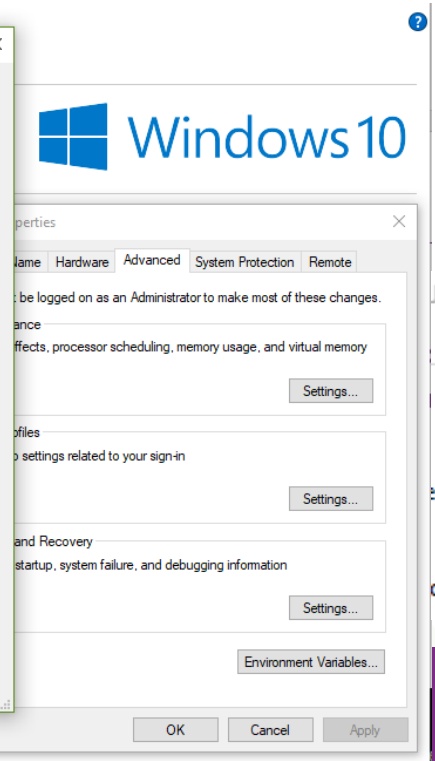
Edycja 2018

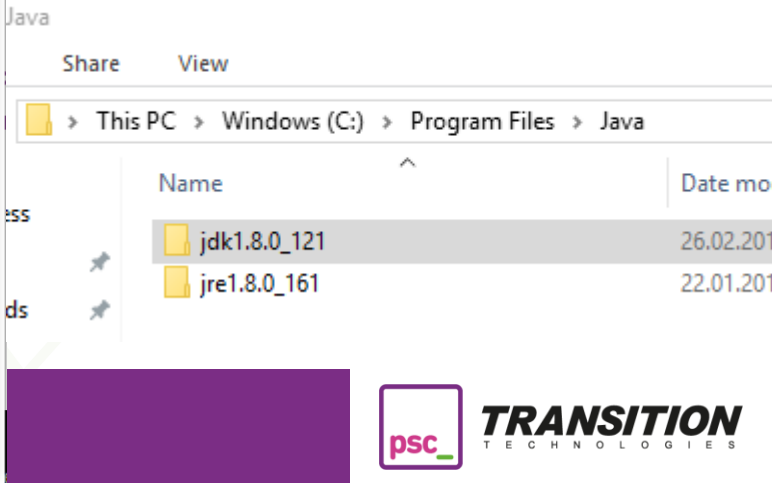
Introductory Exercise

- Install newest Java (JRE + JDK!)
- Set environment variable: JAVA_HOME in your operating system
- Using command line or terminal, type: *java -version*

```
C:\Users\natkanskiz>java -version
java version "1.8.0_161"
Java(TM) SE Runtime Environment (build 1.8.0_161-b12)
Java HotSpot(TM) 64-Bit Server VM (build 25.161-b12, mixed mode)
```







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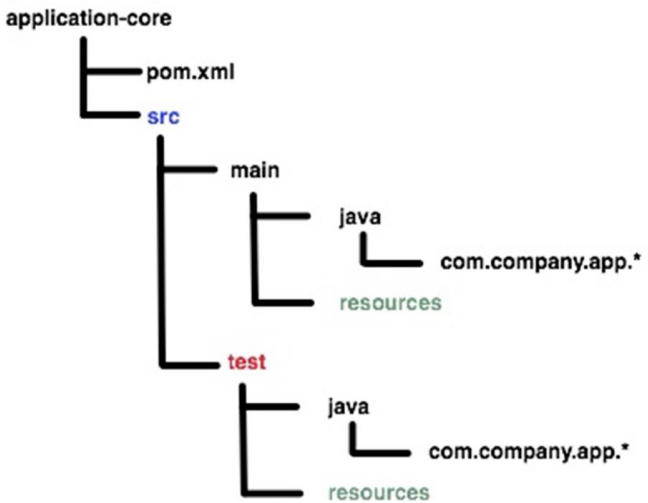
Start your development with Maven!

- **Advanced build tool to support the developer at the whole process of a software project**
  - Typical developer tasks: compile, tests, pack into JAR, run
- **Automates creation of the initial folder structure for the Java application**
- **Management of dependencies (no need to manual download of external libraries)**
- **Repository: dependencies can be loaded from the local file system, from the Internet or public repositories**
- **Management of releases**
- **Simple usage: supply project templates (archetypes)**
- **Convention over configuration: avoid as much configuration as possible, by choosing real world default values**
- **Extensible (plugins)**
- **Empower pom.xml**



Scaffolding a project with Maven

- Maven supports project scaffolding, based on project templates called archetype
- Maven comes with number of „ready-to-go” archetypes
- Extremely speeds up the development preparation
- Type: *mvn archetype:generate*
- A pom should minimum have the following information:
  - modelVersion
  - groupId
  - artifactId
  - version

```
<project>
  <modelVersion>4.0.0</modelVersion>
  <groupId>com.mycompany.app</groupId>
  <artifactId>my-app</artifactId>
  <version>1</version>
</project>
```

```
mvn archetype:generate -DarchetypeArtifactId=maven-archetype-quickstart
-DgroupId=com.companyname.bank
-DartifactId=consumerBanking
-DarchetypeArtifactId=maven-archetype-quickstart
-DinteractiveMode=false
```

Maven lifecycles, phases, goals

- 3 built-in build **lifecycles**:
  - **default** - project deployment
  - **clean** - project cleaning
  - **site** - creation of project's documentation
- Each lifecycles is defined by a different list of **phases**, wherein a phase represents a stage in the lifecycle.
- For example, the default lifecycle comprises of the following phases:
  - **validate** - check project correctness
  - **compile**
  - **test** - test the compiled source code using a unit testing
  - **package** - take the compiled code and package into distributable format (JAR/WAR)
  - **verify** - run any checks on results of integration tests to ensure quality criteria are met
  - **install** - install the package into the local repository
  - **deploy** - copies the final package to the remote repository for sharing with other developers and projects.
- **Phase** is made up of plugin **goals**

Maven Exercise

- Download maven package
- Set environment variable: MAVEN_HOME
- Using command line or terminal, check your maven version: *mvn -v* or *mvn --version*
- Generate project with archetype „quickstart” (default)
- Import project into IDE
- Review pom.xml
- Build package using Maven (using command line)
- Add project lombok dependency
- Create simple Java class with lombok annotation
- Build again using Maven

- **Reduce boilerplate code**
- **Generation of constructors, getters/setters, equal and hashCode, toString methods via annotations:**
  - @EqualsAndHashCode
  - @ToString
  - @AllArgsConstructor
  - @Getter
  - @Setter
- **Automatic beans creation**
  - @Data
- **Builder design pattern**
  - @Builder
- **More**: https://projectlombok.org

```
<dependency>
  <groupId>org.projectlombok</groupId>
  <artifactId>lombok</artifactId>
  <version>1.16.20</version>
  <scope>provided</scope>
</dependency>
```

Another Maven's key features that are worth to be known

- Wrappers
- Multi module projects (aggregator)
- Profile
- Own plugins
- Adding goals to life cycle phases
- Local/Remote/Central repositories

- Read more: http://maven.apache.org/index.html

Gradle

- uses script file (**build.gradle**)
- handles two things:
  - **project** is made up of different tasks.
  - **task** means a piece of work which a build performs (compile classes, create JAR, generate Javadoc, or publish to repository).
- uses Groovy language for writing scripts (provides a Domain Specific Language (DSL), for describing builds)
- basic predefined tasks:
  - *init*
  - *tasks*
  - *test*
  - *build*
  - *clean*
- learn more: https://guides.gradle.org/ (tutorials)

Gradle Exercise

- Download Gradle package
- Set environment variable GRADLE_HOME
- Check *gradle -version*
- Create new project: *gradle init --type java-application*
- Import project into your IDE
- Review *build.gradle* file
- Write custom task
- Display all available tasks
- Migrate your Maven project into Gradle
- Run it!

Continuous Integration

- Merging all developer working copies with a shared mainline several times a day
- Repository stability checks
- Regular releases
- Reduce of costs
- Early error/bug detection

Bamboo

Travis CI
Test and deploy with confidence

CircleCI
Automatically build, test, and deploy your project in minutes

AppVeyor
Cloud service for building, testing and deploying Windows apps

Percy
Continuous visual testing and reviews for web apps

Buddy
One-click delivery automation for Web Developers

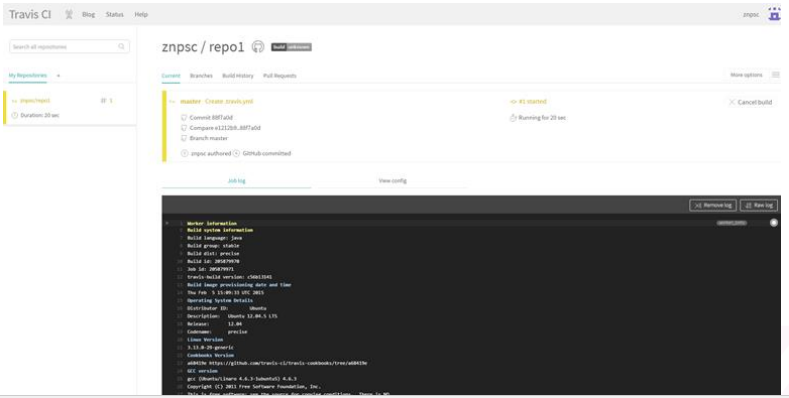
Semaphore
Test and deploy at the push of a button

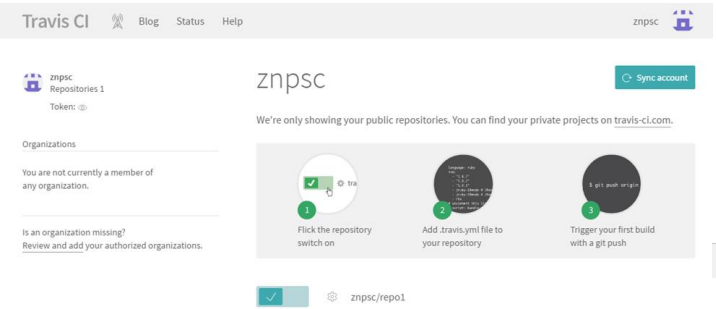
Cloud 66 Skycap
Skycap is a container native CI/CD tool

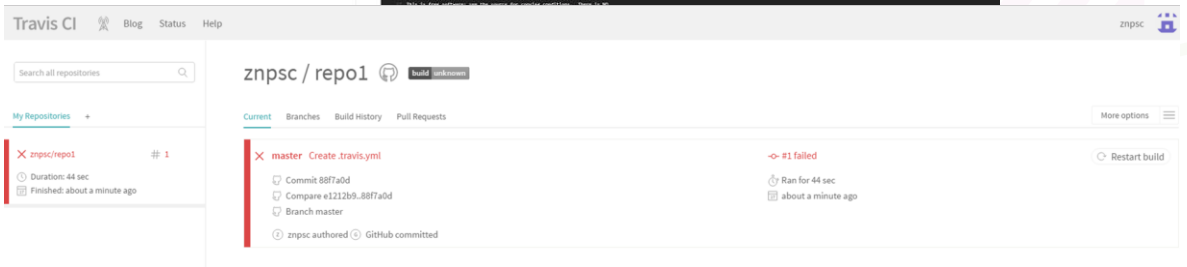
Jenkins

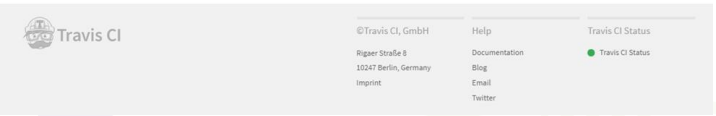
Continuous Integration Exercise

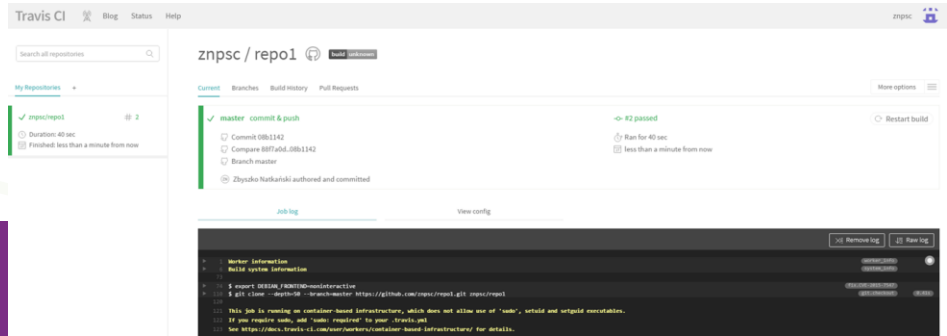
- Use Github account and login: https://travis-ci.com
- Use synchronize button to download your repositories from GitHub
- Activate repository for which you would like to start *continuous integration*
- Add *.travis.yml* file to your repository
- Run Travis CI for your project











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