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| Instructions for the author: Headings present in the document should not be deleted |
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| Controls Configuration Database  Development Environment Setup Instructions |
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| Author | Affiliation | Editor | Approver |
| Miha Vitorovič | Cosylab |  |  |

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# Development Platform

Default development platform for CCDB is CentOS 7.

# Development Environment

CCDB has following environment requirement.

## Java

CCDB is a Java application and therefore requires Java to run.

### Java SDK

Install Java 8 software development kit.

sudo yum install java-1.8.0-openjdk-devel

Java environment variable is set by a adding a script file java.sh to /etc/profile.d/ with line exporting environment variable with Java path.

export JAVA\_HOME=/usr/lib/jvm/java

### Java JRE

Java 8 must be selected as default Java.

sudo alternatives --config java

## Git

Git must be installed.

sudo yum install git

## Maven

Maven must be installed.

sudo yum install maven

## PostgreSQL

PostgreSQL server must be installed, initialized and enabled.

See [www.postgresql.org/download/redhat](http://www.postgresql.org/download/redhat) for detailed instructions.

sudo yum install postgresql-server

sudo postgresql-setup initdb

sudo systemctl enable postgresql.service

## Wildfly

(For detailed instructions please refer to: <https://docs.jboss.org/author/display/WFLY8/Getting+Started+Guide>)

### Installation

Wildfly application is download from wildfly.org/downloads.

wget <http://download.jboss.org/wildfly/8.2.1.Final/wildfly-8.2.1.Final.tar.gz>

Extracted to suitable location (e.g. /opt).

sudo tar xvfz wildfly-8.2.1.Final.tar.gz -C /opt

A link without version may be created to make updates easy.

sudo ln -s /opt/wildfly-8.2.1.Final /opt/jboss

JBOSS\_HOME environment variable is set by adding a script (jboss.sh) under /etc/profiles.d/ with line exporting environment variable with jboss path.

export JBOSS\_HOME=/opt/jboss

### Wildfly Management User

Wildfly management user must be created by running add-user script and following instructions, selecting Management User and leaving the default ManagementRealm as realm.

sudo $JBOSS\_HOME/bin/add-user.sh

### PostgreSQL JDBC Driver.

JDBC42 driver (current version is 9.4-1208) is downloaded from <https://jdbc.postgresql.org/> .

wget https://jdbc.postgresql.org/download/postgresql-9.4.1208.jar

To add driver to Wildfly server needs to be started.

sudo $JBOSS\_HOME/bin/standalone.sh

Driver is added by connecting to command line interface management tool.

sudo $JBOSS\_HOME/bin/jboss-cli.sh --connect

After authenticating as management user driver with correct path may be added.

module add --name=org.postgresql --resources=/pathToDownloads/postgresql-9.4.1208.jar --dependencies=javax.api,javax.transaction.api

/subsystem=datasources/jdbc-driver=postgresql:add(driver-name=postgresql,driver-module-name=org.postgresql,driver-xa-datasource-class-name=org.postgresql.xa.PGXADataSource)

# Application Dependencies

CCDB requires operational RBAC server to check authentication. Instructions on setting Wildfly to gain access are written under [RBAC Settings](#_toc355).

# Source Code

CCDB sources are accessible on Bitbucket and all projects under the root ccdb are configured to be built by maven.

## Main CCDB Project

Git is used to clone source code from Bitbucket. Bitbucket username and password with correct rights are required.

git clone [https://bitbucket.org/europeanspallationsource/ccdb.git](https://bitbucket.org/europeanspallationsource/cable-db.git)

# CCDB Configuration

Various configurations need to be set before CCDB application can function properly.

## PostgreSQL Database Server

(For detailed instructions please refer to: <https://wiki.postgresql.org/wiki/First_steps>)

PostgreSQL server must be up and running to create database.

sudo systemctl start postgresql.service

### PostgreSQL Database and User

PostgreSQL server may be accessed as Postgres user.

sudo -iu postgres psql

New database is created to be used with CCDB application.

CREATE DATABASE ccdb;

New user with all privileges for created database is created, to enable CCDB access to database.

CREATE USER ccdb WITH ENCRYPTED PASSWORD 'ccdb';

GRANT ALL PRIVILEGES ON DATABASE ccdb TO ccdb;

Database is now ready to be populated with tables and data. Psql console may be exited.

\q

### PostgreSQL Authentication Settings

Authentication settings are stored in PostgreSQL configuration file.

sudo gedit /var/lib/pgsql/data/pg\_hba.conf

Line under # IPv4 local connections must be modified to md5 authentication.

From:

host all all 127.0.0.1/32 peer

To:

host all all 127.0.0.1/32 md5

PostgreSQL database needs to be restarted for changes to take effect.

sudo systemctl restart postgresql.service

### Datasources Definition

To enable Wildfly access to databases, datasources must be configured while Wildfly server is not operational.

Datasources are configured in Wildfly standalone configuration $JBOSS\_HOME/standalone/configuration/standalone.xml.

PostgreSQL database is added as xa-datasource.

<profile>

...

<subsystem xmlns="urn:jboss:domain:datasources:2.0">

<datasources>

...

<xa-datasource jndi-name="java:/org.openepics.discs.conf.data"

pool-name="org.openepics.discs.conf.data" enabled="true"  
 use-ccm="false">

<xa-datasource-property name="DatabaseName">ccdb</xa-datasource-property>

<xa-datasource-class>org.postgresql.xa.PGXADataSource</xa-datasource-class>  
 <driver>postgresql</driver>  
 <xa-pool>  
 <is-same-rm-override>false</is-same-rm-override>  
 <interleaving>false</interleaving>

<pad-xid>false</pad-xid>

<wrap-xa-resource>false</wrap-xa-resource>

</xa-pool>

<security>

<user-name>ccdb</user-name>

<password>ccdb</password>

</security>

<validation>

<validate-on-match>false</validate-on-match>

<background-validation>false</background-validation>

</validation>

<statement>

<share-prepared-statements>false</share-prepared-statements>

</statement>

</xa-datasource>

...

</datasources>

## Database Tables

CCDB uses FlyWay to migrate database versions.

### FlyWay Properties

Flyway properties must be configured in file ccdb/ccdb-flyway/flyway.properties.

flyway.user=ccdb

flyway.password=ccdb

flyway.url=jdbc:postgresql:ccdb

### Database Migration

Flyway migration is run.

cd ~/git/ccdb/ccdb-flyway

mvn flyway:migrate

## Wildfly Settings

To configure Wildfly setting, server has to be shut down.

### RBAC Settings

To enable Wildfly to use RBAC , properties with correct values are added to Wildfly standalone configuration $JBOSS\_HOME/standalone/configuration/standalone.xml.

</extensions>

<system-properties>

...

<property name="rbac.primaryServicesURL"   
 value="https://rbac.esss.lu.se:8443/service" />

<property name="rbac.primarySSLHost" value="rbac.esss.lu.se" />

<property name="rbac.primarySSLPort" value="8443" />

<property name="rbac.useLocalService" value="false" />

<property name="rbac.certificateStore"  
 value="$JBOSS\_HOME/standalone/configuration/.rbac/" />

<property name="rbac.cookie.domain" value=".esss.lu.se" />

</system-properties>

### Additional Settings

Blob Store directory is created and its path passed as a property.

</extensions>

<system-properties>

...

<property name="org.openepics.discs.conf.props.BlobStoreRoot"  
 value="$JBOSS\_HOME/standalone/blobStore" />

</system-properties>

### Optional Settings

There are more optional properties that can be set in order to enable CCDB access to external applications or to set different parameters.

</extensions>

<system-properties>

...

<property name= "org.openepics.discs.conf.props.namingAppURL"  
 value="[https://naming.esss.lu.se](https://naming.esss.lu.se/rest)" />

<property name="org.openepics.discs.conf.props.detectNamingStatus" value="TRUE" />

<property name="org.openepics.discs.conf.props.restrictToConventionNames"  
 value="TRUE" />

<property name="org.openepics.discs.conf.props.cableDBAppURL"  
 value="<https://ics-services.esss.lu.se/cable-test>" />

<property name="org.openepics.discs.conf.props.cableDBStatus" value="TRUE" />

<property name="org.openepics.discs.conf.props.auditLogRows" value="10" />

<property name="org.openepics.discs.conf.props.auditLogColumns" value="10" />

### Security Domain Configuration

Security domain configuration is added to Wildfly standalone configuration $JBOSS\_HOME/standalone/configuration/standalone.xml.

<profile>  
 ...

<subsystem xmlns="urn:jboss:domain:security:1.2">

<security-domains>  
 ...

<security-domain name="ccdb.security-domain" cache-type="default">

<authentication>

<login-module code="se.esss.ics.rbac.loginmodules.RBACLoginModule"  
 flag="required">

<module-option name="RBACResource" value="ControlsDatabase" />

<module-option name="RBACPermissionsOfInterest"  
value="WriteAlignmentRecords,WriteComponentTypes,WriteDataTypes,WriteDevices,WriteInstallationRecords,WriteProperties,WriteSlots,WriteUnits" />

<module-option name="mapRBACPermissionsToASRoles" value="false" />

<module-option name="loggedInASRoles" value="user,USER" />

</login-module>

</authentication>

</security-domain>

<security-domains>

# Build and Deploy

Standalone configuration of the Wildfly server is started.

sudo $JBOSS\_HOME/bin/standalone.sh

The project is build and deployed to Wildfly using maven.

For core application ccdb/conf-core project is deployed.

cd ~/git/ccdb/conf-core

sudo mvn clean package wildfly:deploy $\*

For webservice ccdb/ccdb-ws project is deployed.

cd ~/git/ccdb/ccdb-ws

sudo mvn clean package wildfly:deploy $\*

# Application Access

The application is now be accessible on localhost:8080/ccdb-test.