

Standalone Engineering Dashboard deployment using WAR file

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Summary: This section describes how to **install** and **configure** the **Engineering Dashboard 1.x and 2.x** in **WAR** file format (i.e. web application server required).

Introduction

How many Engineering Dashboards do I need?

CAST highly recommends that you install **one** Engineering Dashboard and consolidate **all your Dashboard schemas** into this.

Standalone or combined WAR file?

CAST provides the Engineering Dashboard in two WAR files as follows:

WAR file name	Description
com.castsoftware.aip.dashboard. engineering.<version>.war	Traditional " standalone " WAR file containing only the Engineering Dashboard. This document describes the installation using this WAR file.
com.castsoftware.aip.dashboard. <version>.war	" Combined " WAR file containing both the Engineering Dashboard and the Health Dashboard.

You are free to use **whichever WAR file you prefer** to deploy the Engineering Dashboard (the requirements and prerequisites are identical), however if you are using **both the Health Dashboard and Engineering Dashboard**, to fulfil (for example) a "risk and quality" use case, then it would make sense to take advantage of the combined **com.castsoftware.aip.dashboard.<version>.war** file and deploy **both dashboards from the same WAR file**. If you do so, please note the following about using the "combined" WAR file:

- There is no need to specifically configure a URL for your Engineering Dashboard drilldown (via the "microscope" icon) from the Health Dashboard - when using the combined "WAR" file, access to the Engineering Dashboard from the Health Dashboard is **pre-configured**.
- Security access and authentication is **common** to both Dashboards. Therefore, if you setup Active Directory authentication, then this must be used to access both Dashboards - you cannot use "Default Authentication" for one Dashboard and "Active Directory" for the other.
- Role configuration is **common** to both Dashboards. Therefore "UserA" that has been granted the "admin" role, will have the "admin" role in both Dashboards.
- Data authorization is **common** to both Dashboards. Therefore if you authorize "UserA" to view Application "B" only via the **authorizations.xml file**, then this is true for both Dashboards. Note that authorizations based only on **Tags** and **Categories** created for the Health Dashboard (Tags and Categories are a feature that is not available in the Engineering Dashboard) **WILL** be applied in the Engineering Dashboard when using the combined war file.
- Group configuration is **common** to both Dashboards, regardless of the authentication mode in use. Therefore if you authorize "GroupD" to view Application "E" only, then this is true for both Dashboards.
- On login, the user will be presented with a choice of Dashboard as shown below (*Image 1*) in a "**Welcome**" page. Clicking **Access** will take the user to the custom login screen for the chosen Dashboard where a "**Return to welcome page**" URL is available if the user wishes to login to the other Dashboard (*Image 2*):

Image 1 - Welcome page

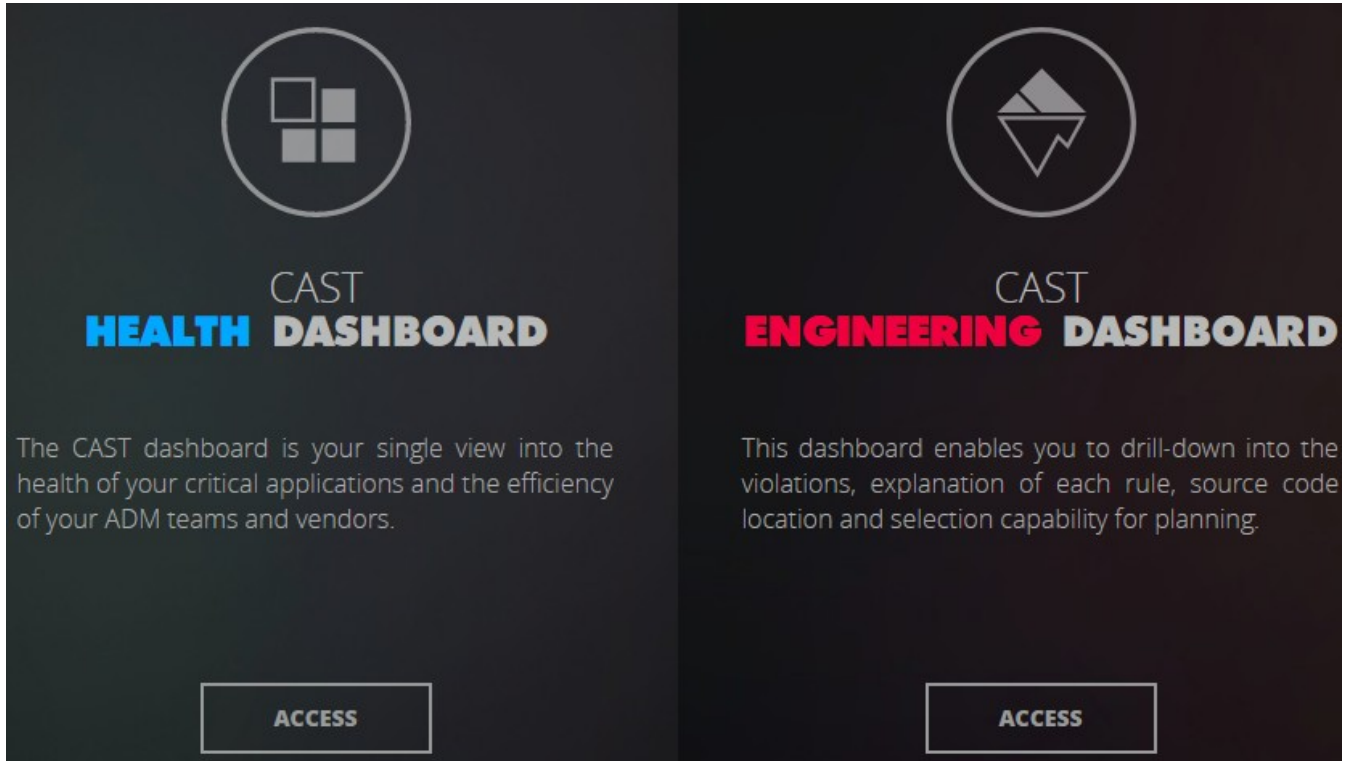
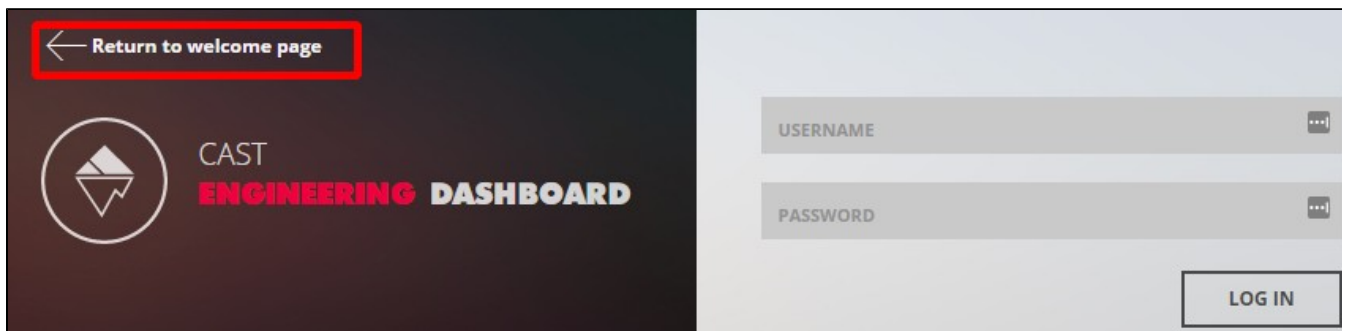


Image 2 - Return to welcome page URL



Requirements

See [Standalone dashboard - installation requirements](#).

Pre-installation check list

Before beginning the installation process, please ensure that you have carried out all of the following tasks and that the following requirements have been met:

✓	Ensure that your web application server is up and running.
✓	Ensure you have read all Release Notes accompanying CAST products for any last-minute information.
✓	Decide where the Engineering Dashboard will be installed.
✓	Ensure that your user login on the target machine has sufficient user privileges to install applications.
✓	Make sure you have the required .WAR file ready for deployment.

Installation procedure



This document assumes you are using **Apache Tomcat** in a **Windows** or **Linux environment** to host the Engineering Dashboard. For Supported Application Servers for WAR file deployment, please see: [Standalone dashboard - installation requirements](#). If you are using **IBM Websphere Application Server** in a **Linux** environment, please see [Deployment on IBM WebSphere Application Server](#).

The installation process is divided into various steps:

Step 1	Rename and deploy the .WAR file on your application server
Step 2	Configure your deployed .WAR file
Step 3	Install the license key
Step 4	Restart Tomcat and test connection
Step 5	Configure user authentication
Step 6	First login and become admin - 2.1 only
Step 7	Configure roles
Step 8	Generate snapshot data
Step 9	Configure data authorization

Step 1 - Rename and deploy the .WAR file on your application server

Rename WAR file

The name of the .WAR file will be included in the URL used to access the dashboard in a browser, as listed below. Therefore, before you deploy the .WAR file, you may wish to rename it to your own chosen name:

- **1.11.0** - the deployed folder will be named **com.castsoftware.aip.dashboard.engineering.<version>** (standalone .WAR) or **com.castsoftware.aip.dashboard.<version>** (combined .WAR)
- **1.10.0** - the deployed folder will be named **CAST-Engineering** (standalone .WAR) or **CAST-Health-Engineering** (combined .WAR)

Deploy the WAR file

Locate the .WAR file and move it to the web application installation location. By default on Apache Tomcat this is set to:

```
CATALINA_HOME\webapps
```

If the Apache Tomcat server is running, the .WAR file will then be unpacked and deployed in a folder matching the name of the .WAR file. If the Apache Tomcat server is not running, start it up and the WAR file will be automatically deployed.



Note that:

- you can find out more about the CATALINA_HOME environment variable and how to configure it in [Apache Tomcat installation and configuration options](#)
- you can also use the **deploy** action in [Apache Tomcat manager](#) to deploy the WAR file:

Deploy

Deploy directory or WAR file located on server

Context Path (required):

XML Configuration file URL:

WAR or Directory URL:

Deploy

WAR file to deploy

Select WAR file to upload No file chosen

Deploy

Configuration

Re-read TLS configuration files

TLS host name (optional)

Re-read

Step 2 - Configure your deployed .WAR file

For CAST Dashboards 1.x

context.xml file configuration

When the .WAR has been deployed you now need to configure the **context.xml** file to tell the web application where the Dashboard Service(s) are stored. This file is located here:

```
CATALINA_HOME\webapps\<deployed_war>\META-INF\context.xml
```

Instructions for Tomcat 8 / 8.5 / 9

Open the **context.xml** file (as detailed above) with an editor. By default, the file will contain an **uncommented** template as follows - this is tailored for connections to **Dashboard schemas** located on a **CAST Storage Service / Postgres** instance running with **port 2280** using **Tomcat 8 / 8.5 / 9**:

```
<Resource name="jdbc/domains/AED" url="jdbc:postgresql://localhost:2280/postgres"
  connectionInitSqls="SET search_path TO [Central Schema];"
  username="operator" password="CastAIP"

  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1"
  initialSize="5" maxTotal="20" maxIdle="10" maxWaitMillis="-1"/>
```

- Set the URL parameter to the server on which the **Dashboard schema** is located:
 - change the "localhost" to the name of the server on which the host CSS is located
 - change the **port** from 2280 if necessary
- Change **[Central Schema]** to the name of the **Dashboard schema** you are using.
- Ensure the **username** and **password** parameters are correct (note that if you need to **encrypt** the username and password to avoid entering names in clear text, please see: [Encrypt login and password for database and LDAP](#))
- You should end up with a section something like this:

```
<Resource name="jdbc/domains/AED" url="jdbc:postgresql://my_schema:2282/postgres"
  connectionInitSqls="SET search_path TO my_central_schema;"
  username="operator" password="CastAIP"

  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1"
  initialSize="5" maxTotal="20" maxIdle="10" maxWaitMillis="-1"/>
```

Following any changes you make, **save the context.xml file** and then **restart** your application server so that the changes are taken into account.



Note that it is **critically important** to configure the **initialSize**, **maxTotal**, and **maxIdle** parameters according to your consumption use case and the number of schemas you want to configure. The default values are high but could probably be decreased to limit the number of active connections to your database instance (eg. `initialSize="2" maxTotal="10" maxIdle="2"`). Please see the "**Optimize context.xml**" section in **Configure the Health Dashboard for large numbers of Applications** for more information about these parameters, or consult the relevant Apache Tomcat documentation: <https://tomcat.apache.org>.

Instructions for Tomcat 7

Open the **context.xml file** (as detailed above) with an editor. By default, the file will contain an **uncommented** template as follows - this is tailored for connections to **Dashboard schemas** located on a **CAST Storage Service / Postgres** instance running with **port 2280** using **Tomcat 8 / 8.5 / 9**:

```
<Resource name="jdbc/domains/AED" url="jdbc:postgresql://localhost:2280/postgres"
  connectionInitSqls="SET search_path TO [Central Schema];"
  username="operator" password="CastAIP"
  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1"
  initialSize="5" maxTotal="20" maxIdle="10" maxWaitMillis="-1"/>
```

You need to comment this template by adding **<!--** and **-->** around the section:

```
<!--
<Resource name="jdbc/domains/AED" url="jdbc:postgresql://localhost:2280/postgres"
  connectionInitSqls="SET search_path TO [Central Schema];"
  username="operator" password="CastAIP"
  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1"
  initialSize="5" maxTotal="20" maxIdle="10" maxWaitMillis="-1"/>
-->
```

Now locate the **Tomcat 7** template - this is located here:

```
<!-- Tomcat 7 Documentation : http://ci.apache.org/projects/tomcat/tomcat7/docs/jndi-resources-howto.html -->
>
<!-- These connections examples on Tomcat 7 are provided for CSS connections especially useful for REST API
on central database.
add parameter if you don't want to use the connection pool :
- for CSS : initConnectionSqls="SET search_path TO ${schema};"

template for resources on CSS with connection pool mode :
<Resource name="jdbc/domains/${domainName}"
  url="jdbc:postgresql://${host}:${port}/postgres"
  username="${user}" password="${password}"
  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1" initialSize="5" maxActive="20" maxIdle="10" maxWait="-1"/>

template for resources on CSS without connection pool mode :
<Resource name="jdbc/domains/${domainName}"
  url="jdbc:postgresql://${host}:${port}/postgres"
  username="${user}" password="${password}"
  initConnectionSqls="SET search_path TO ${schema};"
  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1" initialSize="5" maxActive="20" maxIdle="10" maxWait="-1"/>
-->
```

Copy the **Tomcat 7 for CSS without connection pool mode** template into **uncommented white space**:

```
<Resource name="jdbc/domains/${domainName}"
  url="jdbc:postgresql://${host}:${port}/postgres"
  username="${user}" password="${password}"
  initConnectionSqls="SET search_path TO ${schema};"
  auth="Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1" initialSize="5" maxActive="20" maxIdle="10" maxWait="-1"/>
```

- Set the `${domainName}` value to AED
- Set the URL parameter to the server on which the **Dashboard schema** is located:
 - change the `${host}` to the name of the server on which the host CAST Storage Service/PostgreSQL instance is located
 - change the `${port}` values to the required port (e.g.: 2280, 2282, 2284 or a custom port depending on the CAST Storage Service/PostgreSQL instance you are running).
- Ensure the `${user}` and `${password}` parameters are correct - use the **operator** and **CastAIP** username/password combination if you have not changed these defaults (note that if you need to **encrypt** the username and password to avoid entering names in clear text, please see: [Encrypt login and password for database and LDAP](#))
- Change `${schema}` to the name of the **Dashboard schema**
- You should end up with a section something like this:

```
<Resource name="jdbc/domains/AED"
  url="jdbc:postgresql://my_server:2282/postgres"
  username="operator" password="CastAIP"
  initConnectionSqls="SET search_path TO my_central_schema;"
  auth="{Container" type="javax.sql.DataSource" driverClassName="org.postgresql.Driver"
  validationQuery="select 1" initialSize="5" maxActive="20" maxIdle="10" maxWait="-1"/>
```

- Following any changes you make, **save the context.xml file**.



Note that it is **critically important** to configure the **initialSize**, **maxActive** and **maxIdle** parameters according to your consumption use case and the number of schemas you want to configure. The default values are high but could probably be decreased to limit the number of active connections to your database instance (eg. `initialSize="2" maxActive="10" maxIdle="2"`). Please see the **"Optimize context.xml"** section in [Configure the Health Dashboard for large numbers of Applications](#) for more information about these parameters, or consult the relevant Apache Tomcat documentation: <https://tomcat.apache.org>.

Configuring access to multiple Dashboard schemas

If you would like to configure access to multiple Dashboard schemas for use with your Engineering Dashboard, please do as follows:

- For **each additional** Dashboard Service you want to configure access to, please add an **uncommented configuration template** (these are supplied in the **context.xml** file - ensure you chose the correct template for **Tomcat 7** or **Tomcat 8/8.5/9**) for the target CAST Storage Service/PostgreSQL instance underneath the section configured for your initial Dashboard schema
- First change the `name` parameter to something other than `"jdbc/domains/AED"` (the default "name" used in the pre-provided templates) - CAST recommends using the name of your target Dashboard Service - for example `"jdbc/domains/my_central_schema"` (you must retain the `"jdbc/domains"` part of the name). This is because each Dashboard schema you connect to the Engineering Dashboard must have a **unique** "name" parameter
- Set the URL parameter to the server on which the additional **Dashboard schema** is located:
 - change the `${host}` to the name of the server on which the host CAST Storage Service/PostgreSQL instance is located
 - change the `${port}` values to the required port (e.g.: 2280, 2282, 2284 or a custom port depending on the CAST Storage Service/PostgreSQL instance you are running).
- Ensure the `${user}` and `${password}` parameters are correct - use the **operator** and **CastAIP** username/password combination if you have not changed these defaults (note that if you need to **encrypt** the username and password to avoid entering names in clear text, please see: [Encrypt login and password for database and LDAP](#))
- Change `${schema}` to the name of the **Dashboard schema**
- Following any changes you make, **save the context.xml file**.

Connection pooling

It is possible to modify the connection configuration for the Engineering Dashboard to pool multiple Dashboard schemas in one resource "domain". In other words, you no longer have to configure one resource (in the context.xml) per Dashboard schema, instead, one resource (in the context.xml) can function for multiple Dashboard schemas. Please see [CAST Dashboard Service schema connection configuration pooling](#) for more information.



Using a custom CAST Storage Service or PostgreSQL database other than the default postgres

If you are using **AIP Core 8.3.40** it is possible to connect to a custom CAST Storage Service/PostgreSQL database other than the default "postgres" (previously custom databases were not permitted for use with CAST). To be able to exploit this change, see [Using a custom CAST Storage Service or PostgreSQL database other than the default postgres](#).

For CAST Dashboards 2.x

Modify application.properties to define connection to CSS/PostgreSQL for AIP schemas

When the .WAR has been deployed you now need to configure the **application.properties** file to tell the web application on which **CAST Storage Service/PostgreSQL instance** the Dashboard schemas are stored. This file is located here:

```
CATALINA_HOME\webapps\<<deployed_war>\WEB-INF\classes\application.properties
```

Locate the following section in the file:

```

## DATASOURCE
# Resource1 is the datasource name used in domains.properties
# Adapt server name (localhost) and port (2282) if required
# You can add multiple datasources if you want to connect to multiple CSS Servers. Datasource name must be
unique
# You have to configure your domains names and relative schema names in domains.properties
restapi.datasource[0].url=jdbc:postgresql://localhost:2282/postgres
restapi.datasource[0].username=operator
restapi.datasource[0].password=CastAIP
restapi.datasource[0].poolname=Resource1
restapi.datasource[0].minimumIdle=10
restapi.datasource[0].maximumPoolSize=20

```

If all your Dashboard schemas are located **on one single CAST Storage Service/PostgreSQL instance** then you need to modify the url, username and password entries to match your target CAST Storage Service/PostgreSQL, for example:

```

## DATASOURCE
# Resource1 is the datasource name used in domains.properties
# Adapt server name (localhost) and port (2282) if required
# You can add multiple datasources if you want to connect to multiple CSS Servers. Datasource name must be
unique
# You have to configure your domains names and relative schema names in domains.properties
restapi.datasource[0].url=jdbc:postgresql://192.168.200.104:2282/postgres
restapi.datasource[0].username=operator
restapi.datasource[0].password=CastAIP
restapi.datasource[0].poolname=Resource1
restapi.datasource[0].minimumIdle=10
restapi.datasource[0].maximumPoolSize=20

```

If your Dashboard schemas are located **on multiple CAST Storage Services/PostgreSQL instances**, you need to add in the additional servers as shown in the example below:

- Ensure that you modify the url, username, password and resource entries to match your target CAST Storage Service/PostgreSQL. In particular, the resource entry must be unique within the **application.properties** file.
- The [0] must also be incremented for additional CAST Storage Service/PostgreSQL instances, for example, use restapi.datasource [1], restapi.datasource [2] etc.

```

## DATASOURCE
# Resource1 is the datasource name used in domains.properties
# Adapt server name (localhost) and port (2282) if required
# You can add multiple datasources if you want to connect to multiple CSS Servers. Datasource name must be
unique
# You have to configure your domains names and relative schema names in domains.properties
restapi.datasource[0].url=jdbc:postgresql://192.168.200.104:2282/postgres
restapi.datasource[0].username=operator
restapi.datasource[0].password=CastAIP
restapi.datasource[0].poolname=Resource1
restapi.datasource[0].minimumIdle=10
restapi.datasource[0].maximumPoolSize=20

restapi.datasource[1].url=jdbc:postgresql://192.168.200.105:2282/postgres
restapi.datasource[1].username=operator
restapi.datasource[1].password=CastAIP
restapi.datasource[1].poolname=Resource2
restapi.datasource[0].minimumIdle=10
restapi.datasource[0].maximumPoolSize=20

```

Save the file before proceeding.

i minimumIdle and maximumPoolSize

The following options are used to govern the connections from the web application to the target CAST Storage Service/PostgreSQL instance:

```
restapi.datasource[0].minimumIdle=10
restapi.datasource[0].maximumPoolSize=20
```

CAST recommends using the default options unless you are experiencing performance issues. The options are used as follows:

minimumIdle	The minimum number of connections that should be kept in the pool at all times (even if there is no traffic). Default value is 10. Idle connections are checked periodically.
maximumPoolSize	The maximum number of active connections that can be allocated from this pool at the same time. The default value is 20.

See also [Configure the Health Dashboard for large numbers of Applications.](#)

i Using a custom CAST Storage Service or PostgreSQL database other than the default postgres

If you are using **AIP Core 8.3.40** it is possible to connect to a custom CAST Storage Service/PostgreSQL database other than the default "postgres" (previously custom databases were not permitted for use with CAST). To be able to exploit this change, see [Using a custom CAST Storage Service or PostgreSQL database other than the default postgres.](#)

Modify domains.properties

You now need to configure the **domains.properties** file which provides a link between the **CAST Storage Services/PostgreSQL instances** defined in the **application.properties** file and the Dashboard schemas containing the relevant snapshot data. This file is located here:

```
CATALINA_HOME\webapps\<<deployed_war>\WEB-INF\classes\domains.properties
```

This file is delivered empty as shown below:

```
# Domains for ED
# empty lines in this file lead to connection error, remove all empty lines
# - You have to align [Resource1] with the resource name configured in application.properties
# - You have to replace [Central Schema1] by the central schema name
# - Domains names must be unique
# AED1=Resource1,[Central Schema1]
# AED2=Resource1,[Central Schema2]
```

For each Dashboard schema that you need to display in the CAST Engineering Dashboard, **add one line to the file** ensuring that there are no empty lines:

AED1	This is known as the "domain" and this must be unique in the domains.properties file. Therefore for each Dashboard schema you need to display in the CAST Engineering Dashboard, you need to assign one unique domain . You can use any domain name notation you want, however, CAST highly recommends incrementing the number, i.e. AED1, AED2, AED3 etc.
Resource1	This entry refers to the CAST Storage Service/PostgreSQL instance as defined in the application.properties file.
[Central Schema1]	This entry refers to the Dashboard schema containing the relevant Application data.

For example, for one single Dashboard schema called "MEUDON_CENTRAL" stored in the CAST Storage Service/PostgreSQL instance defined in **Resource1** in the **application.properties** file, add the following:


```
# Domains for ED
# empty lines in this file lead to connection error, remove all empty lines
# - You have to align [Resource1] with the resource name configured in application.properties
# - You have to replace [Central Schemal] by the central schema name
# - Domains names must be unique
# AED1=Resource1,[Central Schema1]
# AED2=Resource1,[Central Schema2]
AED1=Resource1,MEUDON_CENTRAL
```

For multiple Dashboard schemas where all schemas are located in the same CAST Storage Service/PostgreSQL instance defined in **Resource1** in the **application.properties**, add the following:

```
# Domains for ED
# empty lines in this file lead to connection error, remove all empty lines
# - You have to align [Resource1] with the resource name configured in application.properties
# - You have to replace [Central Schemal] by the central schema name
# - Domains names must be unique
# AED1=Resource1,[Central Schema1]
# AED2=Resource1,[Central Schema2]
AED1=Resource1,MEUDON_CENTRAL
AED2=Resource1,SEVRES_CENTRAL
AED3=Resource1,PARIS_CENTRAL
```

For multiple Dashboard schemas where the schemas are located on different CAST Storage Services/PostgreSQL instances (**Resource1** and **Resource2**) as defined in the **application.properties** file, add the following:

```
# Domains for ED
# empty lines in this file lead to connection error, remove all empty lines
# - You have to align [Resource1] with the resource name configured in application.properties
# - You have to replace [Central Schemal] by the central schema name
# - Domains names must be unique
# AED1=Resource1,[Central Schema1]
# AED2=Resource1,[Central Schema2]
AED1=Resource1,MEUDON_CENTRAL
AED2=Resource2,SEVRES_CENTRAL
AED3=Resource2,PARIS_CENTRAL
```

Save the file before proceeding.

Modify application.properties to define connection to CSS/PostgreSQL for the roles/permissions schema - 2.1 only

In **2.1 only**, an interface exists to manage [User roles - 2.x and above](#) and [Data authorization - 2.x and above](#) - this interface stores all its records in a **dedicated schema** on a **CAST Storage Service/PostgreSQL instance**. This instance does not need to be the same as used for your AIP schemas (Dashboard/Measure schemas), however, the required schema is small and therefore CAST recommends using an existing CAST Storage Service/PostgreSQL instance to host it. The schema is created automatically when you start up your Dashboard deployment if it does not already exist.

The **application.properties** file contains a section dedicated to this schema - this file is located here:

```
CATALINA_HOME\webapps\<<deployed_war>\WEB-INF\classes\application.properties
```

Locate the following section in the file:

```
#datasource configuration for user management
spring.datasource.url=jdbc:postgresql://localhost:2282/postgres?
ApplicationName=DASHBOARDS&currentSchema=cast_dashboards
spring.datasource.platform=postgres
spring.datasource.username=operator
spring.datasource.password=CastAIP
spring.datasource.initialization-mode=always
spring.datasource.driver-class-name=org.postgresql.Driver
spring.liquibase.change-log=classpath:db/changelog/db.changelog-master.xml
spring.liquibase.default-schema=cast_dashboards
spring.liquibase.enabled=true
```

Change the line `spring.datasource.url` to match the CAST Storage Service/PostgreSQL instance you intend to use for the roles/permissions schema, for example:

```
#datasource configuration for user management
spring.datasource.url=jdbc:postgresql://192.168.200.104:2282/postgres?
ApplicationName=DASHBOARDS&currentSchema=cast_dashboards
spring.datasource.platform=postgres
spring.datasource.username=operator
spring.datasource.password=CastAIP
spring.datasource.initialization-mode=always
spring.datasource.driver-class-name=org.postgresql.Driver
spring.liquibase.change-log=classpath:db/changelog/db.changelog-master.xml
spring.liquibase.default-schema=cast_dashboards
spring.liquibase.enabled=true
```

Save the file before proceeding. This will ensure that a schema called "**cast_dashboards**" is created on the target CAST Storage Service /PostgreSQL instance when you start the web application.



Using a custom CAST Storage Service or PostgreSQL database other than the default postgres

If you are using **AIP Core 8.3.40** it is possible to connect to a custom CAST Storage Service/PostgreSQL database other than the default "postgres" (previously custom databases were not permitted for use with CAST). To be able to exploit this change, see [Using a custom CAST Storage Service or PostgreSQL database other than the default postgres](#).

Step 3 - Install the license key

As explained in [Dashboard Service license key configuration](#), when you want to access a **Dashboard schema** using the **CAST RestAPI** (i.e. via the **Engineering Dashboard**, or via the **CAST Report Generator**), a special **license key** is required. This license key grants specific access to one or multiple Dashboard schemas for the web application in which it is installed (i.e. the Engineering Dashboard or the CAST RestAPI).

You must therefore install the license key and, if you are using a restricted license key, define data access authorization. These two steps are explained in [Dashboard Service license key configuration](#) in the sections **How do I install a license key?** and **How to authorize users when using a RESTRICTED license key**.

Step 4 - Restart Tomcat and test connection

Restart Tomcat

Before proceeding, ensure you **restart** your application server so that the configuration changes you made are taken into account.

Test access to the Engineering Dashboard

You can now access the Engineering Dashboard using the URL:

```
http://<server_name>[:<port_number>]/<name-of_deployed_war>
```

You should see the login page as follows - this indicates that the initial setup was successful:

The screenshot shows the login interface for the CAST Engineering Dashboard. On the left, there is a dark sidebar with the CAST Engineering Dashboard logo and name. The main content area is light gray and contains two input fields for 'USERNAME' and 'PASSWORD'. A 'LOG IN' button is positioned at the bottom right of the form.



Error messages are documented in [Error Messages](#).

Step 5 - Configure user authentication

This step involves configuring how your users will **authenticate** with the CAST Engineering Dashboard. Most organizations opt for LDAP/Active Directory integration so that users can use their corporate username/password to access the resources they need. The Engineering Dashboard also has a built in username/password authentication mechanism which is enabled "out of the box". See [User authentication](#).

Step 6 - First login and become admin - 2.1 only

By default, the CAST Dashboard requires that at least one user is granted the **ADMIN role** following the first login after the [User authentication](#) configuration. This ensures that one user can access all data and configuration settings. See [First login and become admin](#). This step is not required when using **Dashboards 1.x** and can be skipped.

Step 7 - Configure roles

This step involves configuring **roles** for users and groups that are accessing the CAST Engineering Dashboard. See [User roles](#).

Step 8 - Generate snapshot data

Before your users can "consume" data via the CAST Engineering Dashboard, you need to **generate snapshot data**.

Step 9 - Configure data authorization

An **Authorization** defines permission to access and "consume the data" in a **specific Application** or **group of Applications** via the CAST Engineering Dashboard. If permission is not granted, or a "restriction" is used, then any information related to this Application will be not accessible: application properties such as name, technologies or grades and measures, etc. Therefore, an Authorization must be defined before a user/group of users can access a specific application. See [Data authorization](#).

Additional information

Advanced configuration specific to the CAST Engineering Dashboard:

- [CAST Dashboard Service schema connection configuration pooling](#)
- [Education - change Share and Promote email text](#)
- [Engineering Dashboard json configuration options](#)
- [Engineering Dashboard tile management](#)
 - [Top Modules with Violations or Critical Violations tile](#)
 - [Health Factor weakness or strength tile](#)
 - [Risk Introduced tile](#)
 - [Top Rules with increasing or decreasing violations tile](#)
 - [Action Plan tile](#)
 - [Exclusions tile](#)
 - [External Links tile](#)
 - [Background Facts tile](#)
 - [Custom tile](#)
 - [Industry Standard tiles](#)
 - [OMG Technical Debt tile](#)
 - [Architecture Model violation tile](#)
 - [Top Riskiest Components tile](#)
 - [Top Riskiest Transactions tile](#)
- [Integration of CAST Action Plan into Atlassian JIRA](#)
- [Managing the Engineering Dashboard search indexes](#)
- [Report Generation configuration](#)
- [Using the GUI and CLI tools for Engineering Dashboard](#)
- [View custom Business Criteria in Engineering Dashboard](#)

Additional advanced configuration options:

- [For 2.x JARs or ZIPs](#)
 - [Changing the name of the cast_dashboards schema](#)
 - [Configure additional Dashboard schemas for JAR file deployments](#)
 - [Deploying multiple 2.x ZIPs or JARs on the same server](#)
 - [Modify the user access port for 2.x JAR or ZIP deployments](#)
 - [Start and stop 2.x JAR or ZIP deployments](#)
- [Configuring the Log and Audit Trail](#)
- [Dashboard localization](#)
- [Encrypt login and password for database and LDAP](#)
- [Error Messages](#)
- [General timeout setting](#)
- [Injecting custom tags](#)

- [Lost password and request access configuration](#)
- [Modifying default dashboard text](#)
- [Modifying login error messages](#)
- [Multiple CAST dashboard installation scenario](#)
- [Reload the cache](#)
- [Removing snapshot data](#)
- [RestAPI authentication using an API key](#)