

# celonis

## INSTALLATION GUIDE

Version 1.13

Corresponding Software Version  
Celonis Enterprise 4.7.2

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## TABLE OF CONTENTS

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REVISION HISTORY	3
INTRODUCTION	4
LIST OF ABBREVIATIONS	4
CELONIS ENTERPRISE	6
OVERVIEW	6
PRECONDITIONS	7
CELONIS ENTERPRISE – DEPLOYMENT	8
DEPLOYMENT OPTIONS	8
CELONIS CONFIGURATION STORE	8
CELONIS ENTERPRISE – WINDOWS INSTALLATION	9
INSTALLATION PROCEDURE	9
MULTI-SERVER DEPLOYMENT	9
CELONIS ENTERPRISE – LINUX INSTALLATION	10
PREREQUISITES	10
INSTALLATION PROCEDURE	11
MULTI-SERVER DEPLOYMENT	12
CELONIS ENTERPRISE - COMPUTE CONFIGURATION	13
CELONIS WEB FRONTEND	14
CONFIGURE CELONIS ENTERPRISE	15
DEPLOYING ADDITIONAL JDBC DRIVERS	15
PDF/PNG EXPORT	16
SUPPORT DESK MANAGEMENT	17
REFERENCES	18

## REVISION HISTORY

VERSION NUMBER	VERSION DATE	SUMMARY OF REVISIONS MADE
1.4	MAR 22, 2017	Application Version 4.2
1.5	AUG 10, 2017	Updated version for application version 4.2-SP1
1.6	FEB 23, 2018	Updated version for application version 4.3
1.7	MAI 5, 2018	Updated version for application version 4.4
1.8	JUNE 29, 2018	Small corrections for application version 4.4
1.9	FEB 28, 2019	Updated version for application version 4.5
1.10	DEC 03, 2019	Updated version for application version 4.6
1.11	JAN 23, 2021	Updated version for application version 4.7
1.12	JUN 21, 2021	Updated version for application version 4.7.1
1.13	OCT 20, 2021	Updated version for application version 4.7.2

## INTRODUCTION

### ABOUT THIS GUIDE

Celonis Enterprise is a powerful software for retrieving, visualizing and analyzing real as-is business processes from transactional data. It provides users with the possibility to create and share comprehensive process analyses giving them full transparency about the business processes at hand.

### TARGET AUDIENCE

This guide covers all relevant technical information about correctly installing Celonis Enterprise and is meant to be consulted by the following target audiences:

- System Administrators
- Support Personnel
- Technical Staff

## LIST OF ABBREVIATIONS

ABBREVIATION	EXPLANATION
LTS	Long Term Support
SLES	SUSE Linux Enterprise Server
RHEL	Red Hat Enterprise Linux
SP	Service Pack
OS	Operating System
PDF	Portable Document Format
PNG	Portable Network Graphics
SSL	Secure Sockets Layer
HTTP	Hypertext Transfer Protocol
CA	Certification Authority
URL	Uniform Resource Locator

## CELONIS ENTERPRISE

### OVERVIEW

Celonis is a powerful software for retrieving, visualizing and analyzing real as-is business processes from transactional data. It provides users with the possibility to create and share comprehensive process analyses giving them full transparency about the business processes at hand.

To provide process analyses, Celonis makes use of raw data taken from your database system. For efficient use, the solution requires data to exist in a specified target structure. Thus, raw data from your system will be transformed into that structure on a regular basis. The result will then be stored as either views or tables. As an analytical backbone for the management and storage of the raw data as well as the transformed Process Mining data and as an enabler for its real-time analytics, Celonis uses common RDBM-systems, such as SAP HANA, MS SQL, Oracle, and many more.

Celonis was designed as an analysis platform for the supervision of several business processes and by several users at the same time. Therefore, Celonis is a browser-based web application with a client-server architecture that is easily accessible throughout an enterprise for many users at the same time. User access can be restricted either on analysis-, or data-model-level. Users can also be assigned different roles with different rights for making configurations or creating analyses.

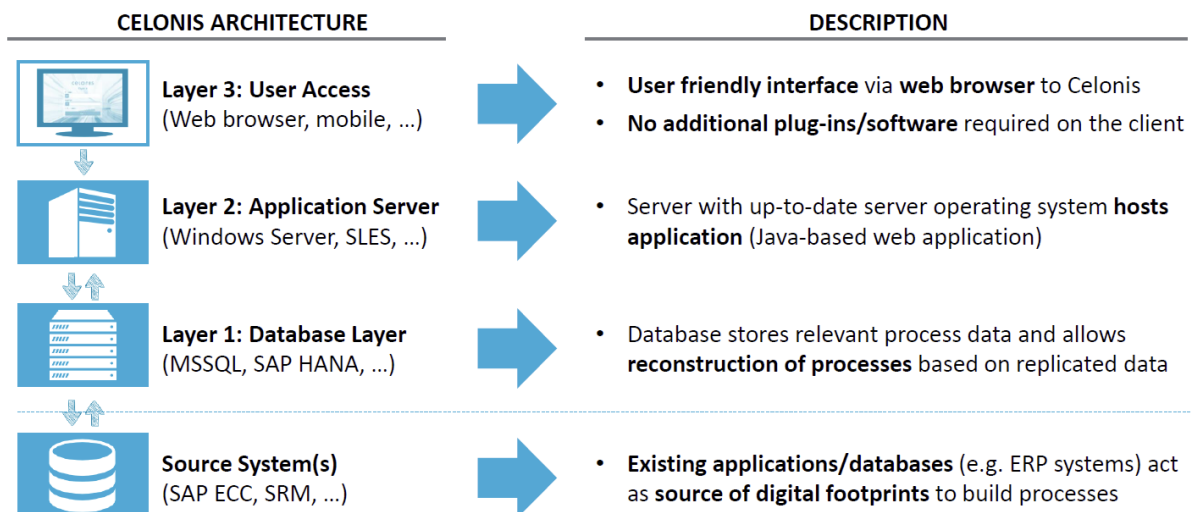


Figure 1: Architecture overview of Celonis Enterprise

## PRECONDITIONS

- Analytics database
- Application Server on Intel architecture with one of the following operating systems:
  - Windows Server 2012 R2 and higher
    - Recommended version: Windows Server 2016
  - SLES 12 SP5 / SLES 15
    - Recommended version: SLES 15
  - RHEL 7.9 / RHEL 8
    - Recommended version: RHEL 8
  - Ubuntu Server 18.04 LTS
    - **Note: Ubuntu 16.04 LTS is no longer supported**
- Possibility to transfer the install files to the application server
- Text editor (syntax highlighting support recommended (e.g. Notepad++))
- Root/admin access
- **Note: Supported databases for the Celonis Configuration Store are:**
  - HSQLDB (embedded)
  - PostgreSQL version 9.6+, PostgreSQL Version 13 is recommended.
  - MSSQL Server 2017 and higher.

More information can be found in the *Configuration Store Setup Guide*.

## CELONIS ENTERPRISE – DEPLOYMENT

### DEPLOYMENT OPTIONS

- Single-Server deployment supporting scale-up architecture
  - Consists of one Celonis Application Server hosting the central application, managing the system, hosting the Celonis Configuration Store and running the Compute service with the process mining engine
- Multi-Server Deployment supporting scale-out architecture
  - Consists of one Celonis Application Server hosting the Central Application, managing the system and hosting the Celonis Configuration Store
  - Consists of one to several Compute Servers running the Compute Service with the Process Mining Engine. The Celonis Application Server can also run the Compute Service for selected Data Models

For more information regarding configuration of the installation, especially with regards to deployment, please consult the Celonis Operation Guide.

**Celonis recommends the Single-Server Deployment for all use cases.**

### CELONIS CONFIGURATION STORE

The Celonis Configuration Store is the central storage of the application metadata, e.g. system settings, users, groups, definitions of Analyses, and Data Models and contains all configuration done via the web frontend. The actual data to be analyzed resides in the connected Analytics Database.

**For medium to large installations as well as any productive installations, Celonis recommends setting up the Celonis Configuration Store using a separate database system. For more information, please consult the Celonis Configuration Store Setup Guide.**



## CELONIS ENTERPRISE – WINDOWS INSTALLATION

### INSTALLATION PROCEDURE

Execute the “cpm 4-enterprise-release-<version>.exe” installer and enter

- The path where the software is to be installed.
- The port under which the web application will be reachable (default: “9000”).
- Set a password for the user for system administrator user “sysadmin”.  
Please note, you must change the password on your first log in (to use the default password “\$admin!” just press enter).

With the installation of the Central Application also the Compute service is installed on the Celonis Application Server. The default port under which the Compute Service will be reachable is 9200. For changing the configuration of the Compute Service, see CELONIS ENTERPRISE - COMPUTE CONFIGURATION. After successful installation start the “Celonis CPM 4 frontend” service for the Central Application and the “Celonis CPM4 compute” service for the Compute Service from the Windows Service Manager.

Support for local installations is only provided if no files other than the configuration files inside the Celonis installation folders are modified.

### MULTI-SERVER DEPLOYMENT

The Multi-Server Deployment allows you to host the Compute Service on multiple servers. For this deployment it is not necessary that the Compute Service is running on the Celonis Application Server. The following steps are necessary to install the Compute service on additional Celonis Compute Servers:

1. Copy the folder “compute” and “jre” from the install directory into a directory on the Compute Server
2. Copy the files “vc redistrib\_2015\_x64.exe”, “vc redistrib\_2010\_x64.exe” and “vc redistrib\_2008\_x86.exe” from the install directory to the Celonis Compute Server and execute each of them
3. Execute “compute\_svc.exe install” inside of the “compute” folder as an administrator on the Celonis Compute Server
4. Check the Operations Guide for the necessary configurations of the Compute Service and the Central Application
5. Start all Compute Services and restart the Central Application

## CELONIS ENTERPRISE – LINUX INSTALLATION

### PREREQUISITES

Before you start the installation, please ensure you meet the following requirements:

- The installation file “cpm4.-enterprise-release-<version>-<dist>.run” is located on your target system (e.g. “/opt/celonis/cpm4/”). There are separate installers for the different supported Linux distributions. Make sure to pick the one matching your distribution and major version
- You have write privileges on the target system
- You have created a dedicated system user to run the Celonis4 Server on the target system (optional). The user must have access to his home directory and to the installation directory.
- You have installed the OS package “graphviz” (including its transitive dependencies) provided by your distribution or verified its existence. The installer will fail if this package is not installed. **It is strongly recommended to install it from your distribution using a package manager:**

#### Ubuntu:

```
sudo apt install graphviz
```

#### RHEL:

```
sudo yum install graphviz
```

#### SLES:

##### - SLES versions 12 or below

For these versions the official distribution of the latest graphviz versions has been deprecated. Therefore, you need to install the latest version of the package manually:

**First** - download the RPM package from openSUSE repository

<https://software.opensuse.org/package/graphviz>

**Second** - install it with the RPM package manager

```
sudo rpm -i graphviz-2.40.1.-lp152.7.7.1.x86_64.rpm
```

##### - SLES versions above 12

For the newest SLES versions official distribution of the latest graphviz versions is still supported with the zypper package manager

```
sudo zypper install graphviz
```

- On some SLES installations is it necessary to update the package “libstdc++6”:
  - Execute “sudo zypper update libstdc++6”
- Additionally, to use the PDF and PNG exporting functionalities, you need to install the following OS packages (including their automatic dependencies) listed in Table 1. Please also refer to the *Linux Installation* chapter below for the details

SLES	RHEL	Ubuntu
<ul style="list-style-type: none"> <li>● xauth</li> <li>● xorg-x11-server</li> <li>● xorg-x11-fonts</li> <li>● libXss1</li> <li>● gconf2</li> <li>● mozilla-nss</li> <li>● libasound2</li> <li>● libasound2-32bit</li> <li>● libgtk-2_0-0</li> <li>● libXtst6</li> </ul>	<ul style="list-style-type: none"> <li>● xorg-x11-xauth</li> <li>● xorg-x11-server-Xvfb (*)</li> <li>● libXtst</li> <li>● GConf2</li> <li>● libXScrnSaver</li> <li>● alsa-lib</li> </ul> <p><small>(*) via <code>subscription-manager repos \</code> <code>--enable rhel-7-server-optional-rpms</code></small></p>	<ul style="list-style-type: none"> <li>● xauth</li> <li>● xvfb</li> <li>● libgtk2.0-0</li> <li>● libxtst6</li> <li>● libxss1</li> <li>● libgconf-2-4</li> <li>● libnss3-1d</li> <li>● libasound2</li> </ul>

Table 1: OS packages for PDF and PNG exporting functionalities

## INSTALLATION PROCEDURE

1. Log in on the target system
2. Navigate to the folder where your installation files are located (e.g. `"/opt/celonis/cpm4/"`)
3. Start the installation script with the following command:
  - o As root: `"sudo bash celonis4.run"`
  - o As non-root: `"bash celonis4.run"`
4. When the installation script is started, it will display the following message if you are running the installer as a non-privileged user. The installation can be continued in non-privileged mode or aborted to run the installer with the root user. **Note:** if you are running the installer with the non-root user, the whole directory structure of the CPM application will be owned by the current user

```
Installing Celonis 4. If you want to run a silent installation, please run the installer with the --silent flag
You are running the installer as a non-privileged user
If you want to install CPM4 globally, please run the installer as root
Continue installation? Y/n
```

Figure 2: Specify the user running the installer

5. Please enter the target directory where you wish to install Celonis Enterprise and press enter (to use the default path `"/opt/celonis/cpm4/"` just press enter)

```
Please specify the target directory [/opt/celonis/cpm4]:
```

Figure 3: Specify target installation directory of Celonis Enterprise

- Specify the port on which you will access the Celonis web frontend (to use the default port "9000" just press enter)

```
Please enter port for the cpm4 server [9000]
```

Figure 4: Specify port for Celonis web frontend

- Specify the initial password for the user sysadmin. This user will be used to log in on the web frontend. Please note, you will have to change the password on your first log in (to use the default password "\$admin!" just press enter)

```
Please specify the initial password for the user sysadmin [$admin!]
```

Figure 5: Specify initial Celonis web frontend password

With the installation of the Central Application, the Compute Service is also installed on the Celonis Application Server. The default port under which the Compute Service will be reachable is 9200. For changing the configuration of the Compute Service, see [CELONIS ENTERPRISE - COMPUTE CONFIGURATION](#). After successful installation navigate to your install directory (default `"/opt/celonis/cpm4/"`) and start the services with the following command:

- As root: `"sudo ./start.sh"`
- As non-root: `"./start.sh"`

With this command the central application and the Compute Service is started. The Central Application alone can be started with the following command:

- As root: `"sudo ./start_application.sh"`
- As non-root: `"./start_application.sh"`

To start only the Compute Service navigate to the Compute directory inside of your install directory (default `"/opt/celonis/cpm4/compute/"`) and start the service with the following command:

- As root: `"sudo ./start_compute.sh"`
- As non-root: `"./start_compute.sh"`

## MULTI-SERVER DEPLOYMENT

The Multi-Server Deployment allows you to host the Compute Service on multiple servers. For this deployment it is not necessary that the Compute Service is running on the Celonis Application Server. The following steps are necessary to install the Compute service on additional Celonis Compute Servers:

- Copy the folder "compute" and "jre" from the install directory into a directory on the Compute Server
- On some SLES installation is it necessary to update the package "libstdc++6":

- Execute “sudo zypper update libstdc++6”
- 3. Start the Compute Service with the following command:
  - As root: “sudo sh start\_compute.sh”
  - As non-root: “sh start\_compute.sh”

## CELONIS ENTERPRISE - COMPUTE CONFIGURATION

To provide a custom configuration for the Compute Service, copy file “application-custom.properties.sample” and name the copy “application-custom.properties”. A custom configuration is necessary for example, when the Compute Service should be reachable on a different port than the default port 9200 or the Celonis Configuration Store should use a separate database system. Especially for the Multi-Server Deployment a custom configuration for all Compute Services is needed. This also includes the Compute Service on the Celonis Application Server, if this is still to be used.

**For security reasons Celonis recommends to provide a custom configuration with a self-generated jwt secret to override the default jwt secret which is generated during installation. For detailed instructions, please refer to the Celonis Operation Guide to understand the Celonis application in depth.**

## CELONIS WEB FRONTEND

You can access the web frontend with the following URL:  
 “http://<hostname of your server>:<port>” (e.g. <http://localhost:9000>)

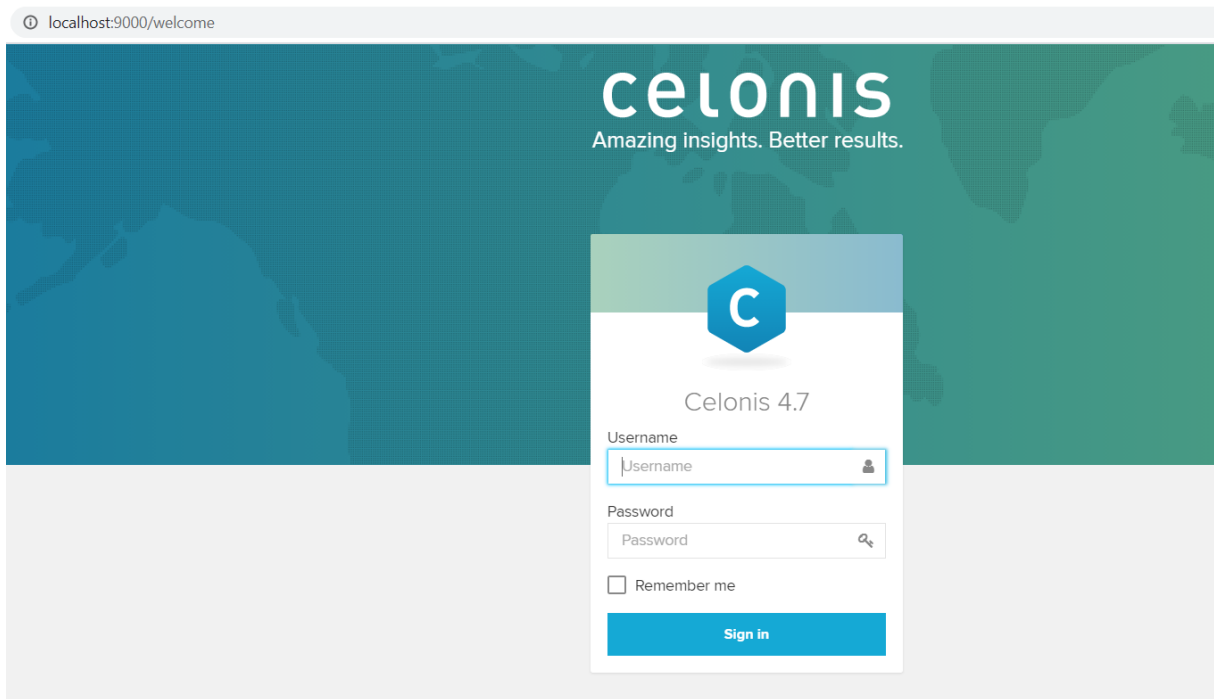


Figure 6: Celonis web frontend

To log in, you can use the user “sysadmin” and the password you provided in step 7 (for Linux) or specified in the installation procedure (for Windows). After the log in, you must activate the license and configure your data as described in Celonis Documentation.

For more information regarding configuration of the installation, especially with regards to security, please consult the Celonis Operation Guide.

## CONFIGURE CELONIS ENTERPRISE

### DEPLOYING ADDITIONAL JDBC DRIVERS

The Celonis Process Mining application is using JDBC to connect to databases, e.g., the Analytics Database. Depending on the database type, Celonis does not provide the JDBC driver, and it has to be deployed by the customer. We indicate those database types with the note “additional driver required”:

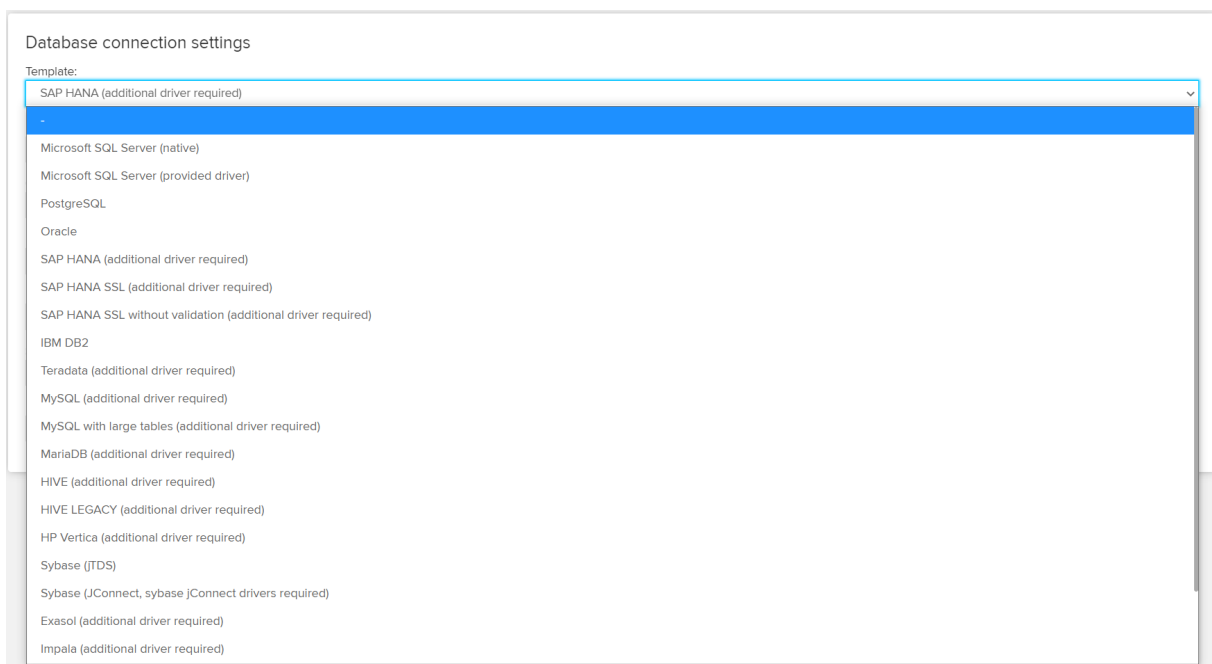


Figure 7: Example - Database Connections

Please follow the steps below to deploy a custom JDBC driver:

1. Acquire the JDBC driver .jar file for the respective database from your database vendor.  
**Please make sure to use a driver version that is compatible with the database version.**
2. Stop the Celonis application
3. Move the JDBC driver into the `<installDir>/lib` folder in the Celonis installation directory
4. Restart the Celonis application and try to connect to the respective database.

## PDF/PNG EXPORT

In case the PDF/PNG exporting does not work, please check the following steps:

- PDF and PNG exporting functionalities are only available on newer Linux distributions (SLES 12, RHEL 7, Ubuntu 18) and on Windows. Please note, that when upgrading the OS (e.g. from SLES11 to SLES12), the software must be reinstalled with the appropriate installer for the new OS
- Make sure you have installed all previously listed OS packages on Linux. Check the log files of the application for possible errors or further missing libraries:
- In case you have SSL activated, the user running the Celonis Enterprise service/process needs to trust the certificate. For certificates signed by an official CA or your company's CA, this should already be the case. In case you are using a self-signed certificate, make sure to add this certificate to the trusted certificates of the service user
- You have correctly set the parameter "server.url" to the URL, at which the application is accessible from within the network (e.g. <https://celonis.mycompany.com>) in the "config-custom.properties" file. In case the local access for the process generating the PDF on the server needs to be different (e.g. because you unload SSL on a frontend server that also handles a third-party authentication), you can set the parameter "server.external" to the address, where the instance is reachable locally. If either "server.url" or "server.external" is provided and is invalid, the application server will fail to start
- The HTTP header "X-Frame-Options" is by default set to "DENY" for security reasons. If you see error messages in the browser console regarding this header while downloading a PDF, you can set the property "http.framepolicy.xframeoptions" in the "config-custom.properties" file to "SAMEORIGIN" while considering the security implications
- In case the PDF only contains the structure of the analysis and charts, but no data (i.e. only lines), your system might be lacking the necessary fonts or font libraries. In this case, you can set the property "externaltool.legacy=true" in the "config-custom.properties" file.
- The user running Celonis needs to have a valid and writable "home" directory for storing temporary files
- As a last resort, you can manually adjust the script and executable used for exporting. Check the log files generated during startup of the application for the current configuration.
- One example of an adjustment would be a manual override of the user's "home" directory (the "home" directory of the user running the Celonis process needs to be writable by this user. If the "home" directory points to a non-writable directory (e.g. "/root"), the exporting will fail)
- If the PDF & PNG export fails with "Request on loopback from external IP", the issue could be caused by reverse-proxy. Adding the following to the pdf-exporter/export.js script should solve the issue: `app.commandLine.appendSwitch("no-proxy-server");`



## SUPPORT DESK MANAGEMENT

To contact Celonis support, you have the following possibilities:

**Hotline:** +49 (0)89 416 159 677

**Email:** [servicedesk@celonis.de](mailto:servicedesk@celonis.de)

**Support-Portal:** <https://servicedesk.celonis.com>

Please include at least the following items in your issue description:

- At what time the incident occurred (date, time, timezone)
- Screenshot or video recording of the error message / situation
- Full product version tag (format: *4.7.2-RELEASE\_c3739d3\_20211027\_1623*) that can be found:
  - In the Celonis frontend, clicking “About” on the bottom left
  - In the log files
  - In the file *config.properties#application.version* inside the installation directory
  - In the file *FILEID* inside the installation directory
- Log files for the past 30 days:
  - Central Application logs: *logs/stdout, logs/stderr*
  - Compute logs: *compute/logs/stdout, compute/logs/stderr*
  - Query engine logs: *compute/root/logs*
- [Linux only] The content content of the following scripts in the installation directory
  - *start.sh*
  - *stop.sh*
  - *start\_application.sh*
  - *stop\_application.sh*
  - *compute/start.sh*
  - *compute/stop.sh*
- Installation location (e.g., *C:\Program Files\Celonis 4 Enterprise* or */opt/celonis/cpm4*)
- Configuration files inside the installation directory:
  - All *\*.vmoptions* files
  - *config.properties*
  - *config-custom.properties* (anonymized sensitive information such as passwords, certificate keys etc)
- Operating system information of the application server (name, version, kernel)
- Hardware information of the application server (available RAM, CPUs, persistent storage)

## REFERENCES

- [Celonis Operation Guide](#)
- [Celonis Configuration Store Setup Guide](#)