

# Adabas & Natural

Community Edition for Docker

October 2021

Version 2.0 15/02/2022

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

Copyright © 2021 Software AG, Darmstadt, Germany and/or Software AG USA Inc., Reston, VA, USA, and/or its subsidiaries and/or its affiliates and/or their licensors.

The name Software AG and all Software AG product names are either trademarks or registered trademarks of Software AG and/or Software AG USA Inc. and/or its subsidiaries and/or its affiliates and/or their licensors. Other company and product names mentioned herein may be trademarks of their respective owners.

Detailed information on trademarks and patents owned by Software AG and/or its subsidiaries is located at <https://softwareag.com/licenses> or <http://softwareag.com/licenses>.

Use of this software is subject to adherence to Software AG's licensing conditions and terms. These terms are part of the product documentation, located at <http://softwareag.com/licenses/> and/or in the root installation directory of the licensed product(s).

This software may include portions of third-party products. For third-party copyright notices, license terms, additional rights or restrictions, please refer to "License Texts, Copyright Notices and Disclaimers of Third Party Products". For certain specific third-party license restrictions, please refer to section E of the Legal Notices available under "License Terms and Conditions for Use of Software AG Products / Copyright and Trademark Notices of Software AG Products". These documents are part of the product documentation, located at <https://softwareag.com/licenses> or <http://softwareag.com/licenses> and/or in the root installation directory of the licensed product(s).

## CONTENTS

<b>1</b>	<b>Welcome .....</b>	<b>4</b>
<b>2</b>	<b>Architecture Overview.....</b>	<b>5</b>
<b>3</b>	<b>Getting Started .....</b>	<b>6</b>
<b>4</b>	<b>Installing the Docker Community Edition.....</b>	<b>7</b>
	4.1 Linux.....	7
	4.2 Windows 10.....	8
<b>5</b>	<b>Login to Docker Hub / AWS.....</b>	<b>9</b>
<b>6</b>	<b>Starting Adabas in a Docker Container.....</b>	<b>11</b>
	6.1 Checking the Adabas Demo Database .....	12
<b>7</b>	<b>Starting Natural in a Docker Container .....</b>	<b>13</b>
<b>8</b>	<b>Downloading and Unpacking NaturalONE.....</b>	<b>14</b>
<b>9</b>	<b>Quick Start Guide for NaturalONE .....</b>	<b>15</b>
<b>10</b>	<b>Establishing the Connection between NaturalONE and the Natural Container.</b>	<b>16</b>
<b>11</b>	<b>Starting Adabas Manager in a Docker Container .....</b>	<b>19</b>
<b>12</b>	<b>Troubleshooting Network Connectivity.....</b>	<b>21</b>
	12.1 NaturalONE cannot connect to Natural running in a container .....	21
	12.2 Natural runtime cannot connect to Adabas running in a container .....	21

## 1 Welcome

Welcome to the Adabas & Natural Community Edition for Docker by Software AG.

This package includes all tools for developing and running applications in Natural, such as:

- NaturalONE Community Edition - Software AG's Eclipse-based development environment for the Natural programming language
- Natural Community Edition for Docker - Natural's runtime and development environment (in a Docker container)
- Adabas Community Edition for Docker - Software AG's database system, including a demo database (in a Docker container)
- Adabas Manager Community Edition for Docker- A web application to administer Adabas databases in Linux and Windows environments, as well as Entire Net-Work suite of products and Adabas Auditing Server

These Community Editions are particularly interesting for you if you want to

- gain practical programming experience with Adabas and Natural
- get familiar with Adabas and Natural in a Docker container

The Adabas & Natural Community Editions for Docker can run on Windows 10 and Linux (x86/64 bit) platforms.

As a prerequisite, a Docker Container compatible environment must be installed on these operating systems (e.g., Docker Community Edition).

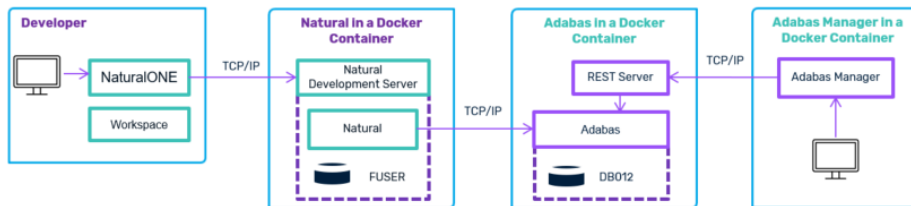
To load the Adabas and Natural Docker images you need to have access to Docker hub or AWS Account.

So that you can start working without much Docker training, you can find all necessary Docker commands in this guide, as well as in the Readme.md files of the Natural Community Edition for Docker, the Adabas Community Edition for Docker and the Adabas Manager Community Edition for Docker. You can use the commands directly via copy & paste.

## 2 Architecture Overview

# ADABAS & Natural Community Edition for Docker

## ENVIRONMENT ARCHITECTURE



NaturalONE is the Development Environment running on a Developer Workstation (Windows / Linux).

NaturalONE connects to Natural running in a Docker Container.

Natural applications are connecting over TCP/IP to the Adabas database running in a Docker Container.

Adabas Manager connect via REST server to Adabas databases running in a Docker Container.

### 3 Getting Started

To run the Adabas & Natural Community Editions for Docker on your computer, just follow these five steps. This requires a connection to the internet.

1. Install the Docker Community Edition.
2. Start Adabas in a Docker container.
3. Start Natural in a Docker container.
4. Download and unpack NaturalONE.
5. Start Adabas Manager in a Docker container.

For NaturalONE, Natural, Adabas and Adabas Manager, an installation in the classical sense is not required.

## 4 Installing the Docker Community Edition

### 4.1 Linux

If you want to run Adabas & Natural in the Docker container on Linux, the Docker Community Edition for Linux must be installed. This is available for different Linux distributions. The installation consists of four steps:

1. Install the required tools.
2. Set up the repository.
3. Install the Docker Community Edition.
4. Start the Docker service.

For CentOS, these steps can be performed with the following four commands:

```
sudo yum install -y yum-utils device-mapper-persistent-data lvm2
sudo yum-config-manager --add-repo
https://download.docker.com/linux/centos/docker-ce.repo
sudo yum install -y docker-ce
sudo systemctl start docker
```

If you want to avoid the "sudo" command for the following Docker "run" commands, you must add the current user to the "docker" group. You can use the following commands:

```
sudo usermod -aG docker <your-user>
sudo systemctl restart docker
```

Please make sure that you log out with your current user and log in again for this modification of group permissions to take effect.

For complete installation instructions or installations on other Linux distributions, use the links below.

Docker installation on CentOS:

<https://docs.docker.com/install/linux/docker-ce/centos/>

Docker installation on Ubuntu:

<https://docs.docker.com/install/linux/docker-ce/ubuntu/>

Further Docker distributions:

<https://docs.docker.com/install/>

Determine the IP address of your environment and note it down. The IP address will be used later to connect the database container, and to connect the development environment with the development server.

On Linux, you can determine the IP address using the following command:

```
ifconfig
```

Look for an entry that starts with "eth" or "ens", and then look for an address in the format "x.x.x.x" (for example, 192.168.229.128).

You can skip the following chapters and go directly to the chapter "[Access to Docker Hub](#)".

## 4.2 Windows 10

Windows 10 supports Docker containers as of the 1607 release.

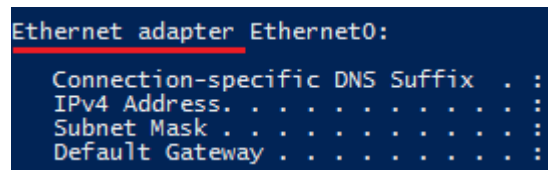
To install the Docker Desktop for Windows, go to <https://docs.docker.com/docker-for-windows/>.

At the top of the resulting page, click the "Install Docker Desktop" link. Click **Get Docker Desktop for Windows** to download the "Docker Desktop Installer.exe", and then install the Docker Desktop for Windows.

Also start the Powershell.

Use the following command to determine the IP address of your environment and note it down:

```
ipconfig
```

A screenshot of a Windows command prompt window with a dark blue background and white text. The text shows the output of the 'ipconfig' command for the 'Ethernet adapter Ethernet0' interface. The output is as follows:

```
Ethernet adapter Ethernet0:  
-----  
Connection-specific DNS Suffix . . :  
IPv4 Address. . . . . :  
Subnet Mask . . . . . :  
Default Gateway . . . . . :
```

Look for an entry "Ethernet adapter" or "Wireless LAN adapter", and then look for an "IPv4 Address" in the format "x.x.x.x" (for example, 192.168.229.128).

The IP address will be used later to connect the database container, and to connect the development environment with the development server.



## 5 Login to Docker Hub / AWS

To load the Adabas and Natural Docker images you need to have access to Docker Hub or account on AWS Marketplace.

If you don't have one yet for AWS please register on [AWS - https://aws.amazon.com/](https://aws.amazon.com/) or access to Docker Hub <https://hub.docker.com/>.

With your account please make sure that you subscribe for the Adabas Community Edition for Docker image, Natural Community Edition for Docker image and Adabas Manager Community Edition image.

Docker Hub:

You can find these images with the following links:

Docker Hub - Public images no need to register:

<https://hub.docker.com/r/softwareag/natural-ce>

<https://hub.docker.com/r/softwareag/adabas-ce>

<https://hub.docker.com/r/softwareag/adabasmanager-ce>

To subscribe please click the “Tags” tab on the Docker Hub website.

Select the latest version and copy the docker pull command.

It is a Community Edition usage are free of charge!

After copying the commands to your Docker Environment and pull your images.

AWS:

[AWS Marketplace: Adabas Community Edition for Docker \(amazon.com\)](#)

[AWS Marketplace: Natural Community Edition for Docker \(amazon.com\)](#)

[AWS Marketplace: Adabas Manager Community Edition for Docker \(amazon.com\)](#)

Search for all images above and subscribe, follow this instruction and keep the data for pulling the image from the market place.

To subscribe

1. Click the “Continue to subscribe” link on the AWS marketplace website.
2. Read the product overview and click on “Continue to Subscribe”
3. Read the “Terms and Conditions” and click on “Continue to Configuration”
4. Click on “Continue to Launch”
5. Click on “View container image details” on the bottom of the page
  - a. Copy the full image for each image
  - b. Copy the login command (only once)

Image name sample.

```
"217273820646.dkr.ecr.us-east-1.amazonaws.com/83fc8d26-1d9b-4ce3-ab26-15ae510f3509/cg-2078808674/natural-ce:9.1.3-latest"
```

Login Command sample:

```
aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 217273820646.dkr.ecr.us-east-1.amazonaws.com
```

Log in to the AWS on your Docker Environment using AWS CLI and run the login command.

See next chapters how to pull the images.

## 6 Starting Adabas in a Docker Container

The Adabas Community Edition is a functionally complete database system against which you can perform database queries and make database changes.

If you start the database with the command below, a demo database is automatically created in the container. Data changes to this demo database are not persisted.

If you need to persist the demo database, you have to:

1. create a directory, and
2. mount this directory.

For further information, see the Readme file of the Adabas Community Edition for Docker in Docker Hub.

To start the Adabas Community Edition for Docker with Adabas running on port 60001 and Adabas REST server running on HTTP port 8190, run the following command:

Docker Hub:

```
docker run -d -p 60001:60001 -p 8190:8190 -e ACCEPT_EULA=Y -e ADADBID=12 -e
"ADA_DB_CREATION=demodb" --name adabas-db softwareag/adabas-ce:<version>
```

AWS:

```
docker run -it -p 60001:60001 -p 8190:8190 -e ACCEPT_EULA=Y -e ADADBID=12 -e
ADA_DB_CREATION=demodb --name adabas-db <<ADABAS_IMAGE_NAME>>
```

The software is now automatically fetched from Docker hub and runs in the background of your computer.

## 6.1 Checking the Adabas Demo Database

After starting the demo database, you can check whether its start was successful:

```
docker exec -it adabas-db adainfo.sh
```

The following should be shown at the end of the output (important: the status must be “active”):

```
%ADAREP-I-TERMINATED, 03-APR-2018 13:46:15, elapsed time: 00:00:00
Database Id. : 012
Database Name : GENERAL_DATABASE
Version :
Config. file : /data/db012/DB012.INI
Status : active
```

## 7 Starting Natural in a Docker Container

The following command starts the Natural container. You have to replace "<OWN-IP>" in the command with the IP address of the host running the Adabas container that you have determined, to get access to the Adabas database.

Docker Hub:

```
docker run -d -p 2700:2700 --add-host adabas-db:<OWN-IP> -e ACCEPT_EULA=Y --name
natural-ce softwareag/natural-ce:<version>
```

AWS:

```
docker run -d -p 2700:2700 --add-host adabas-db:<OWN-IP> -e ACCEPT_EULA=Y --name
natural-ce <<NATURAL_IMAGE_NAME>>
```

The software is now automatically fetched from Docker Hub and runs in the background of your computer.

For further information, see the Readme file of the Natural Community Edition for Docker in Docker Hub.

## 8 Downloading and Unpacking NaturalONE

Download the NaturalONE Community Edition (the Eclipse development environment) as a zip or tar.gz file from:

<https://tech.forums.softwareag.com/t/adabas-natural-ce-for-docker-download>

To receive the download link, you need to sign-in to the Software AG Tech Community, if you haven't already.

Unpack the zip file and start it with "Start\_ONE\_".

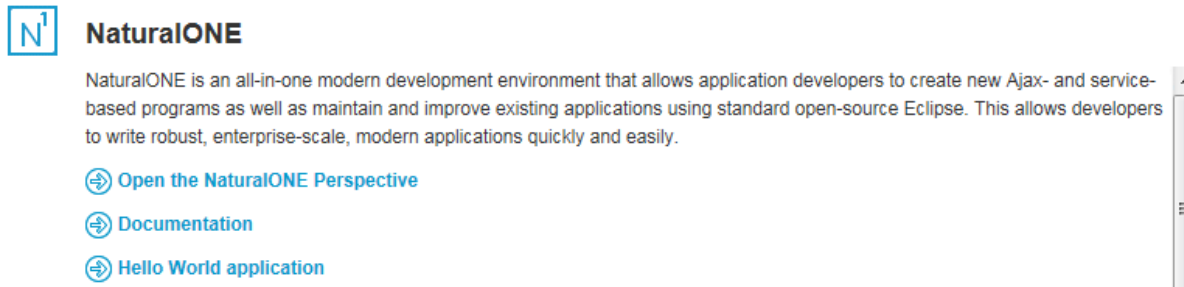
## 9 Quick Start Guide for NaturalONE

Copy the zip or tar.gz file into a directory and unpack the file.

Then go to the installation directory "ONE\_<version>.CE". A shortcut or shell script "Start\_ONE\_<version>.CE" for starting NaturalONE can be found there.

When you start NaturalONE for the first time, you are asked for a workspace directory.

Use the default setting or define another directory. The welcome page of NaturalONE is shown next.



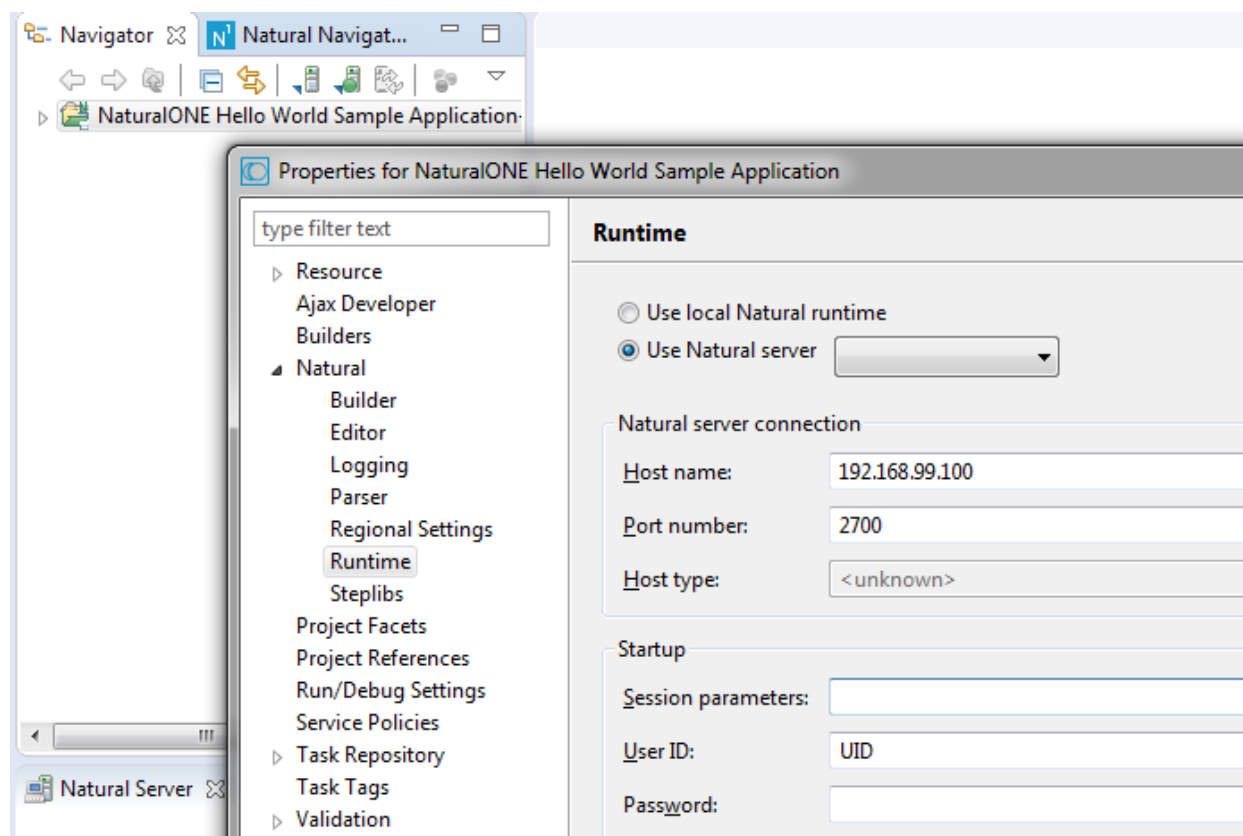
If you are familiar with Eclipse, you can immediately start working on your own projects. Click **Open the NaturalONE Perspective** to start developing Natural applications.

If you want to get to know NaturalONE using the supplied examples, click **Hello World application**. This example uses Natural and Adabas.

## 10 Establishing the Connection between NaturalONE and the Natural Container

NaturalONE must know where to find the runtime environment.

To set the appropriate runtime right-click the project and choose **Properties**.



For **Host name**, enter the IP address of your Docker environment, that is, the address that you have determined previously.

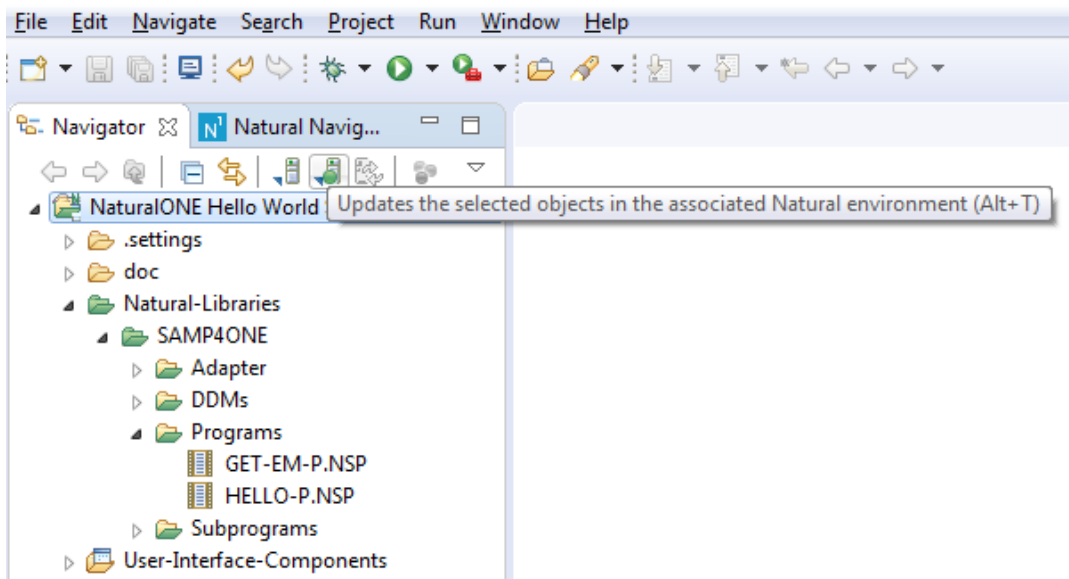
For **Port number**, enter 2700.

For your comfort, the Natural Demo Application is also delivered with the Natural Community Edition for Docker. Therefore, you are immediately able to execute the sample programs using 'Run As', as described below.

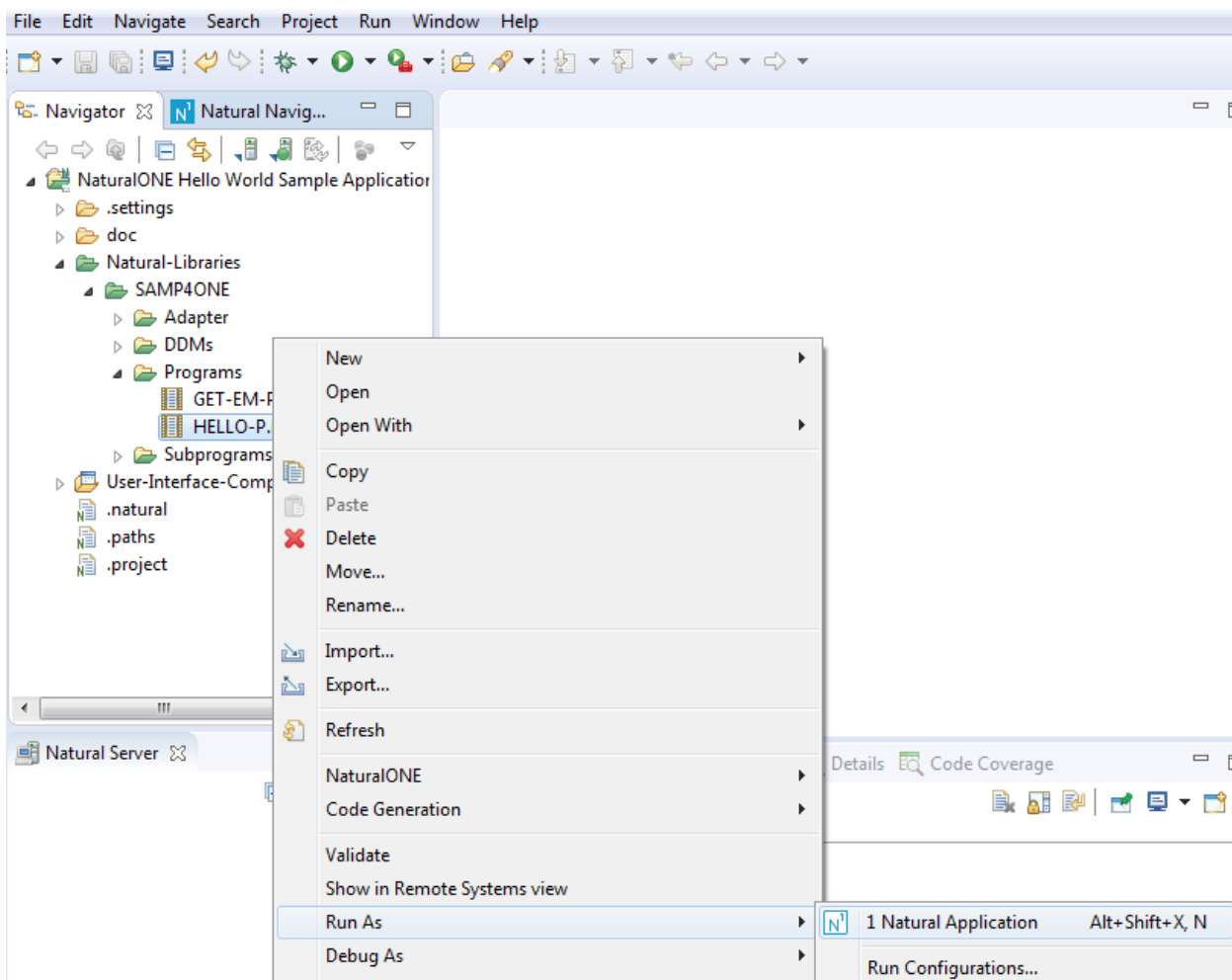
In general, you have to catalog all Natural sources in the workspace inside the Natural runtime environment.

To do so, please select the Natural sample project and click the Update icon.

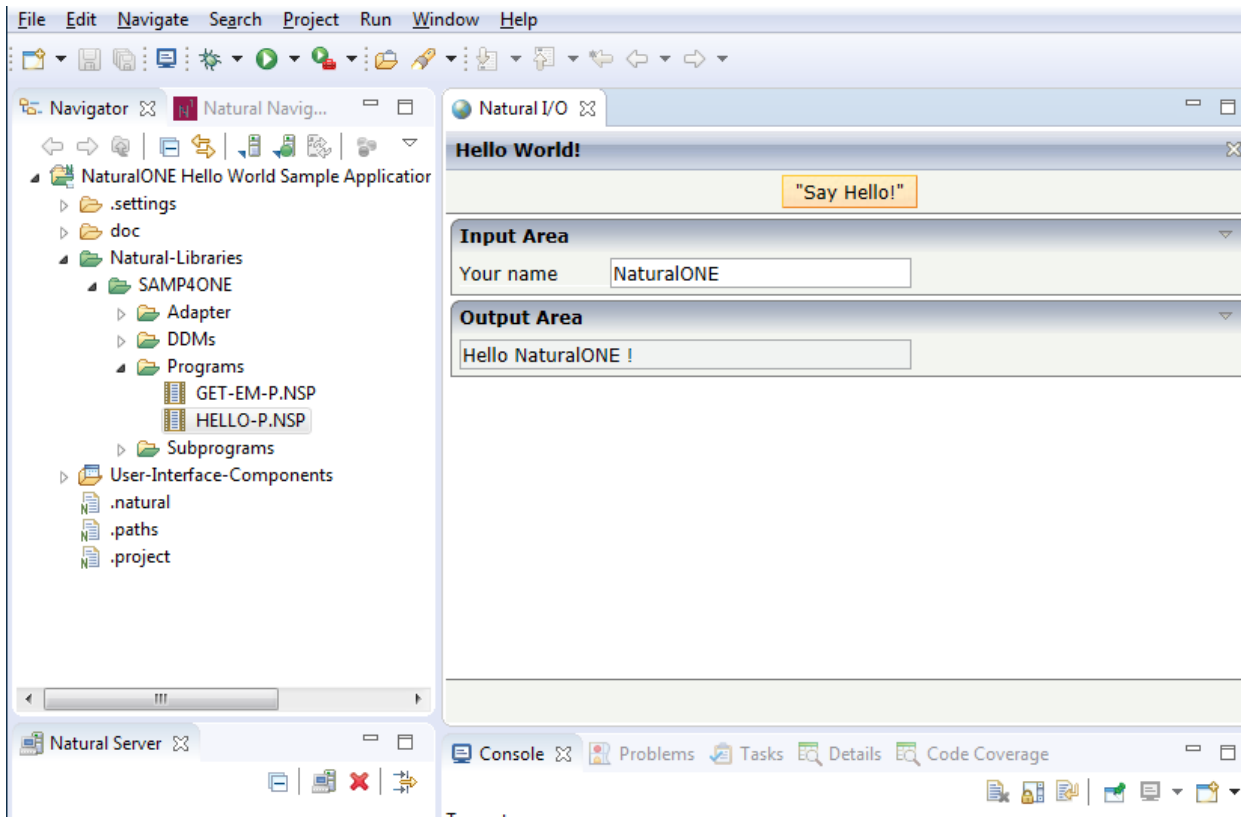




To run the programs, right-click GET-EM-P.NSP or HELLO-P.NSP and then choose **Run As > Natural Application** from the context menu.



After running the Natural program, you will see the "Hello-World" application in the editor area. When you now click "Say Hello!" you will get a corresponding output. The result should look similar to the following:



You can also run the GET-EM-P.NSP program to test successful access to the Adabas database.

If you are new to Natural and NaturalONE please feel free to head over to Software AG's NaturalONE tutorial videos on YouTube. There you can get a basic understanding of NaturalONE and make your first successful steps with Natural:

[www.learnadabasnatural.com](http://www.learnadabasnatural.com)

## 11 Starting Adabas Manager in a Docker Container

The following command starts the Adabas Manager container.

### Docker Hub:

```
docker run -d -p 4990:4990 -e ACCEPT_EULA=Y --name adabas-manager
softwareag/adabasmanager-ce:<version>
```

### AWS:

```
docker run -d -p 4990:4990 -e ACCEPT_EULA=Y --name adabas-manager
<<ADABAS_MANAGER_IMAGE_NAME>>
```

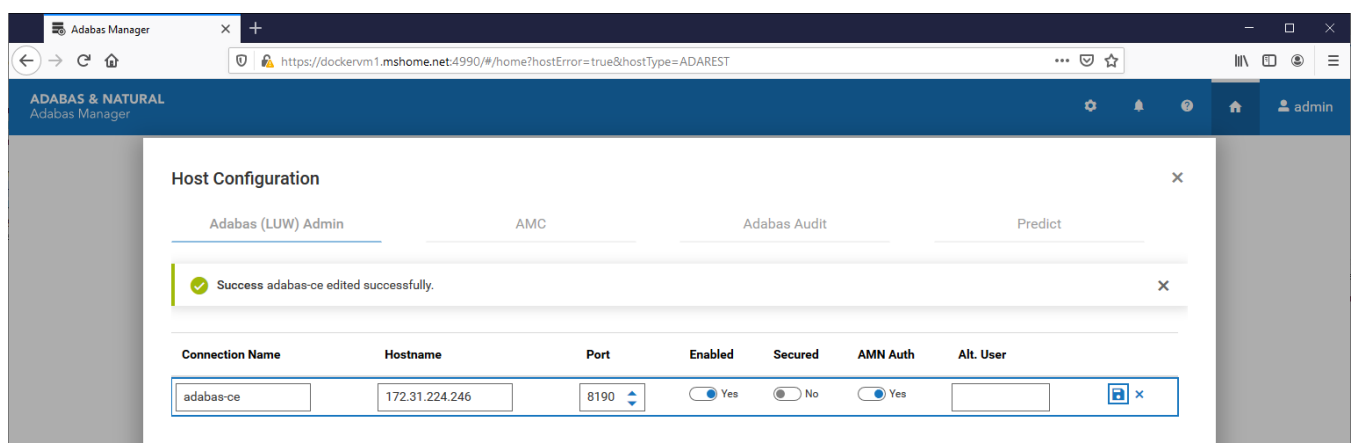
The software is now automatically fetched from Docker Hub and runs in the background of your computer.

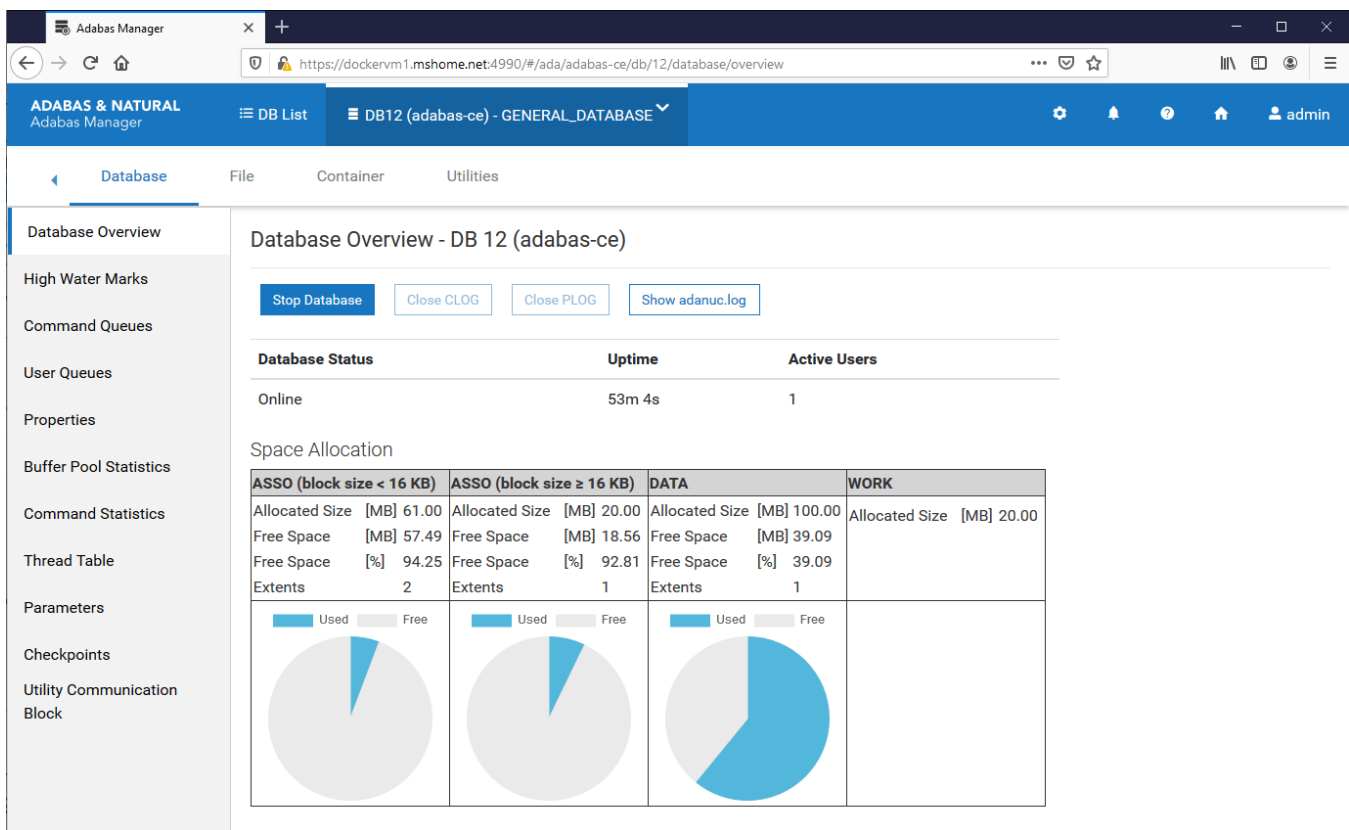
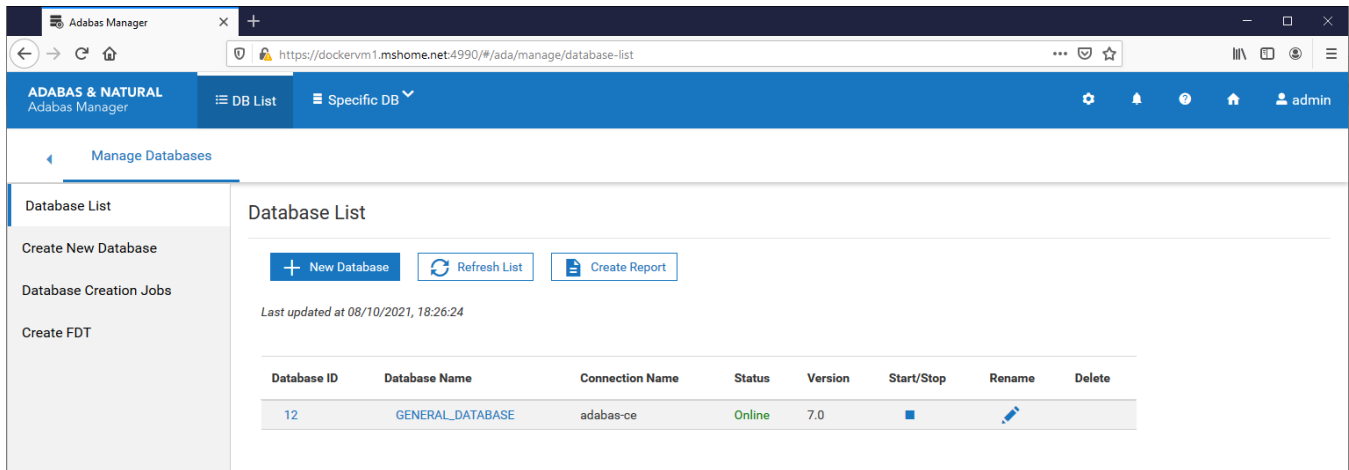
To launch Adabas Manager, enter the address "https://<host of the running container>:4990 " at the URL of a browser.

The Adabas Manager is using SSL encrypted communication (https) and is delivered with a self-signed certificate. You will have to accept and trust the self-signed certificate to see the login page.

Otherwise for further information how to exchange the SSL certificate with a custom trusted certificate, please see the Readme file of the Adabas Manager in Docker Hub. You can login to the Adabas Manager with the User-ID= "admin" and Password= "manage".

Please add the corresponding Adabas REST Server Hostname in Adabas Manager with port 8190 of your running Adabas Community Edition container. You can see the steps in the following illustrations.





For further information, see the Readme file of the Adabas Manager Community Edition for Docker in Docker Hub.

## 12 Troubleshooting Network Connectivity

### 12.1 NaturalONE cannot connect to Natural running in a container

If you are not able to connect to the Natural container on port 2700, you should check first if the IP address you have determined is correct. Try to execute a ping command to see if it is reachable. If you are running in Windows 10 or pure Linux with all components, you could even use “localhost” to connect. With Docker Toolbox you can use the following command to determine your IP address:

```
docker-machine ip
```

In addition to that, check if you have a firewall running on your host machine that is blocking port 2700. Ensure that this port can be reached in your environment.

Port 2700 on your host machine might be already in use. If you have a Natural for Windows version installed on your Windows PC you could stop the appropriate ‘Software AG Natural 8.n NDV Listener Service’.

If port 2700 is in use by a service you cannot stop, you are able to change your port mapping on the host machine to another free port e.g. 2777 by modifying your Docker “run” command:

```
docker run -d -p 2777:2700
```

### 12.2 Natural runtime cannot connect to Adabas running in a container

You can connect to the Natural container on port 2700, but Natural applications running in the container cannot connect to the Adabas database, and you are getting error code 3148.

Check first if you have a firewall running on your host machine that is blocking port 60001. Ensure that this port can be reached in your environment.

If this is not the case, it is possible that you have a loopback address access problem in your configuration so that Natural cannot access the Adabas network on port 60001 through the external IP address.

You could fix this problem using a Docker network while starting your containers. To do so, first stop and remove the already started Adabas and Natural Docker containers.

Change your Quickstart commands to the following three commands:

```
docker network create adabas_natural
```

```
docker run -d -e ACCEPT_EULA=Y -e ADADBID=12 -e "ADA_DB_CREATION=demodb" --network adabas_natural --name ADABAS-DB softwareag/adabas-ce:<version>
```

```
docker run -d -p 2700:2700 --network adabas_natural -e ACCEPT_EULA=Y --name natural-ce softwareag/natural-ce:<version>
```