

Adabas & Natural

Community Edition for Docker

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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 10/11 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).

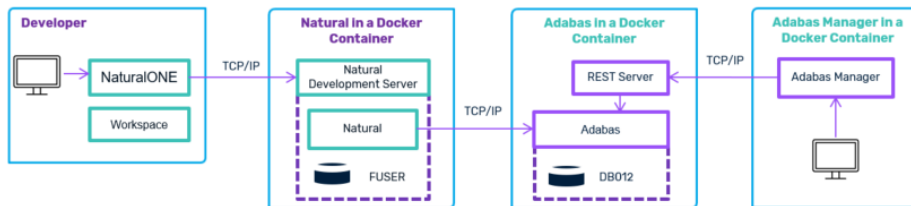
To load the Adabas & Natural Docker images you need to have access to Docker hub or Software AG registry.

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 steps. This requires a connection to the internet.

1. Install the Docker Community Edition or Podman.
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 on Docker, 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 Red Hat 8 on podman, these steps can be performed with the following commands:

```
sudo yum module enable -y container-tools:rhel8
sudo yum module install -y container-tools:rhel8
```

Note - to use the docker images installation replace all "docker" to "podman"

e.g.

```
podman run -d -p 60001:60001 -p 8190:8190 -e ACCEPT_EULA=Y -e ADADBID=12 -e
ADA_DB_CREATION=demodb --name adabas-db sagcr.azurecr.io/adabas-ce:7.2.0
```

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

Podman installation on Red Hat:

<https://podman.io/getting-started/installation>

Look for RHEL version.

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 10/11

Windows 10/11 supports Docker containers.

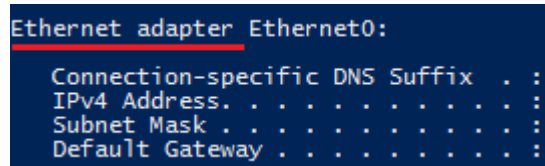
To install the Docker Desktop for Windows, go to <https://docs.docker.com/desktop/install/windows-install/>

Click **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 / Software AG Registry

Docker Hub:

You can find the docker images with the following links on Docker Hub (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 pull the image to your PC, you must login to Docker and copy the pull command on the top right, paste it into your Docker Environment, add a “:” and then add the version you want to use. All available versions are listed in the “Tags” tab at the top of the page. After you modified it, the command will look something like this:

```
docker login
<DOCKER-STORE-USERNAME>
<PASSWORD>
```

```
docker pull softwareag/natural-ce:9.3.1
docker pull softwareag/adabas-ce:7.2.0
docker pull softwareag/adabasmanager-ce:9.2.0.1
```

Software AG Official Registry:

To Pull and subscribe to Software AG official registry you could use your [Empower](#) credentials.

Follow this instruction and keep the data for pulling the images:

1. Navigate to Software AG registry page : <https://containers.softwareag.com/>
2. Login using your Empower credentials
3. Use this links of [Natural Community Edition](#), [Adabas Community Edition](#) and [Adabas Manager community Edition](#) to get the pull command.
4. Review the terms and condition on the top right of the page and click on the checkbox next to it accordantly
5. Click on “Get the pull command”
6. Copy and store your Token Name, Token Password and docker login command. (it will be visible only on the first docker image)
7. Click “Got it”, the window will be closed
8. Select the desired version
9. Copy the pull command

In case you lost your credentials you could click on you avatar on the top right of the page, click setting and Generate password button, then follow the instructions to retrieve your credentials.

Login Command sample:

```
docker login -u my-username-softwareag-com -p my-password sagcr.azurecr.io
```

Login into Software AG public registry environment using your “Docker login” command, with success login pull all the images one after the other using the pull command for each product.

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:7.2.0
```

Software AG registry:

```
docker run -d -p 60001:60001 -p 8190:8190 -e ACCEPT_EULA=Y -e ADADBID=12 -e  
ADA_DB_CREATION=demodb --name adabas-db sagcr.azurecr.io/adabas-ce:7.2.0
```

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

If you wish to view the log, type this command:

```
docker logs adabas-db
```

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, 11-APR-2022 09:57:36, elapsed time: 00:00:00  
  
Database ID      : 12  
Database Name   : GENERAL_DATABASE  
Version         : 7.0  
Config. file    : /data//db012/DB012.INI  
Status         : active  
TCP-Port       : 60001  
TCP-SSL-Port    : Not enabled
```

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:9.3.1
```

Software AG Official Registry:

```
docker run -d -p 2700:2700 --add-host adabas-db:<OWN-IP> -e ACCEPT_EULA=Y --name
natural-ce sagcr.azurecr.io/natural-ce:9.3.1
```

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

If you wish to view the log type this command:

```
docker logs natural-ce
```

For further information, see the Readme file of the Natural Community Edition for Docker in Software AG registry or 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-community-edition-for-docker-download/235228>

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_".

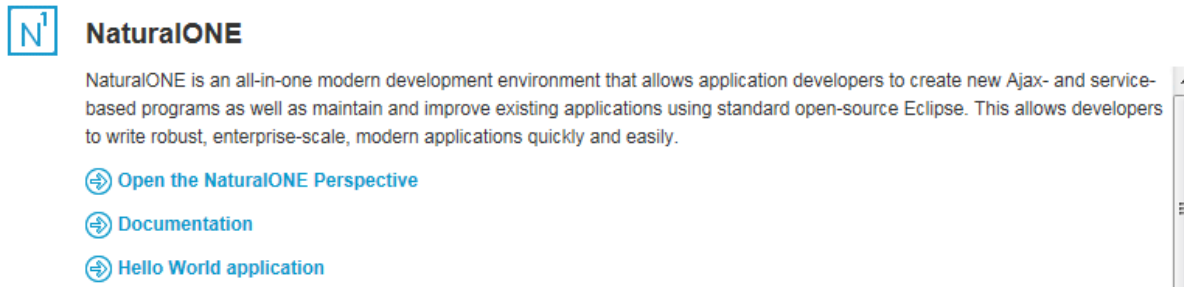
9 Quick Start Guide for NaturalONE

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.



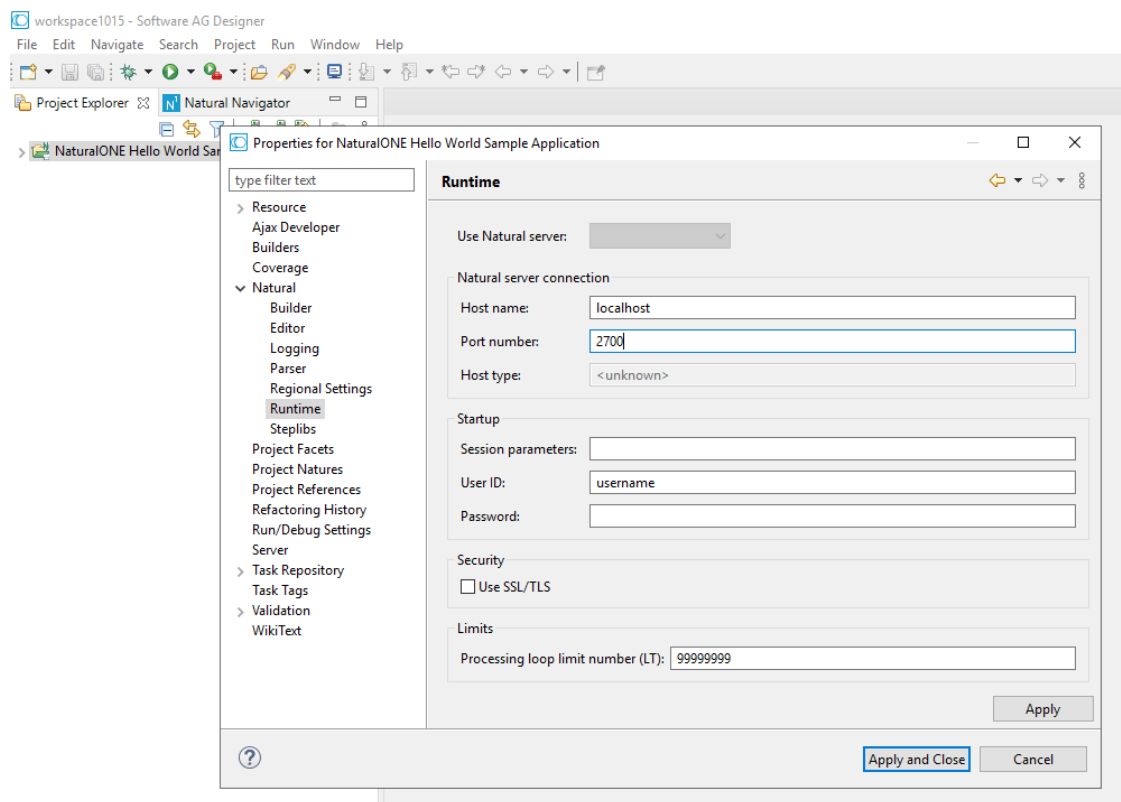
If you are familiar with Eclipse, you can immediately start working on your own projects. Click **Open the NaturalONE Perspective** to start developing Natural applications.

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**.



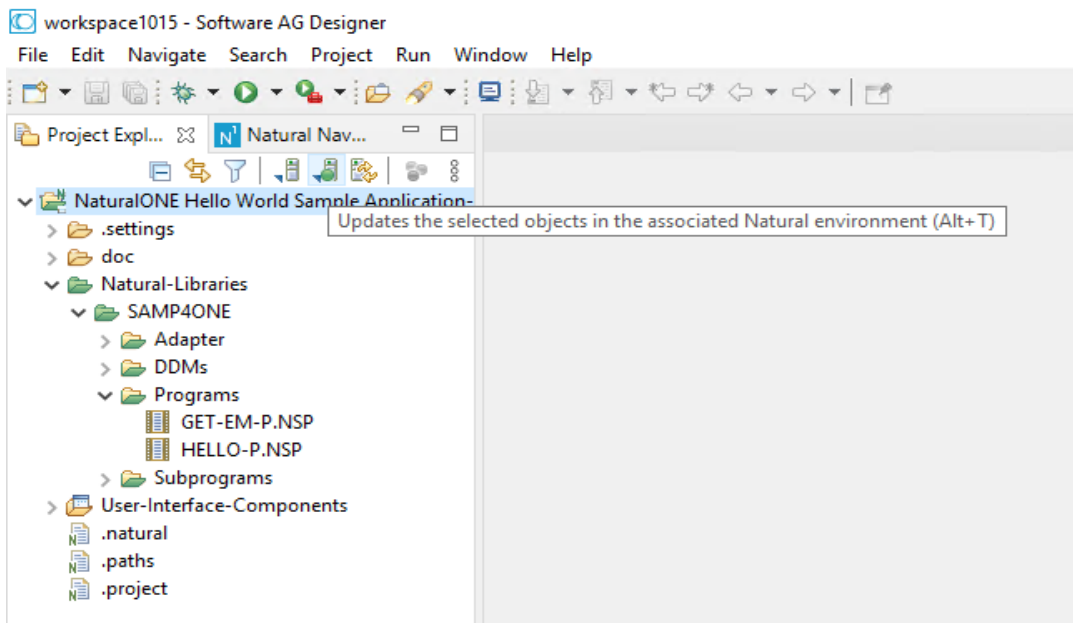
For **Host name**, enter the IP address of your Docker environment, that is, the address that you have determined previously.

For **Port number**, enter 2700.

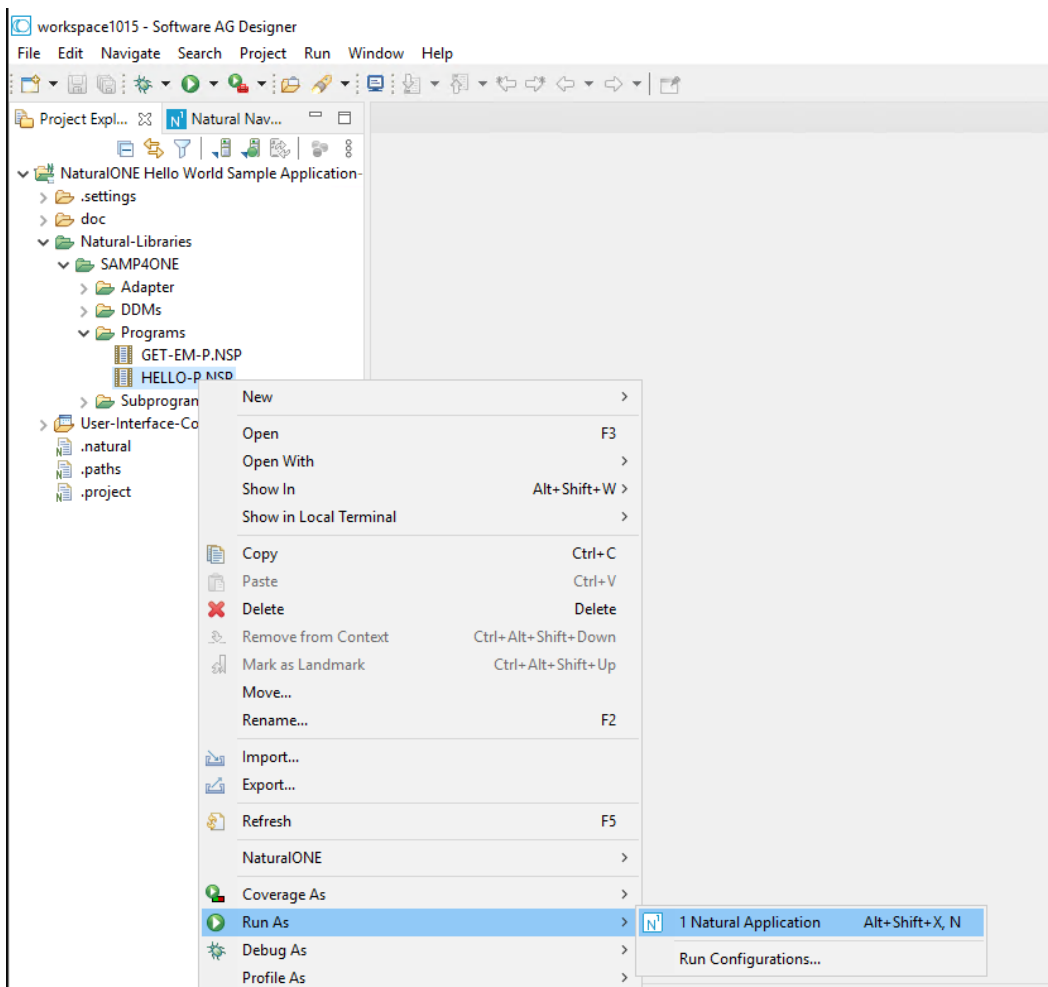
For your comfort, the Natural Demo Application is also delivered with the Natural Community Edition for Docker. Therefore, you are immediately able to execute the sample programs using 'Run As', as described below.

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

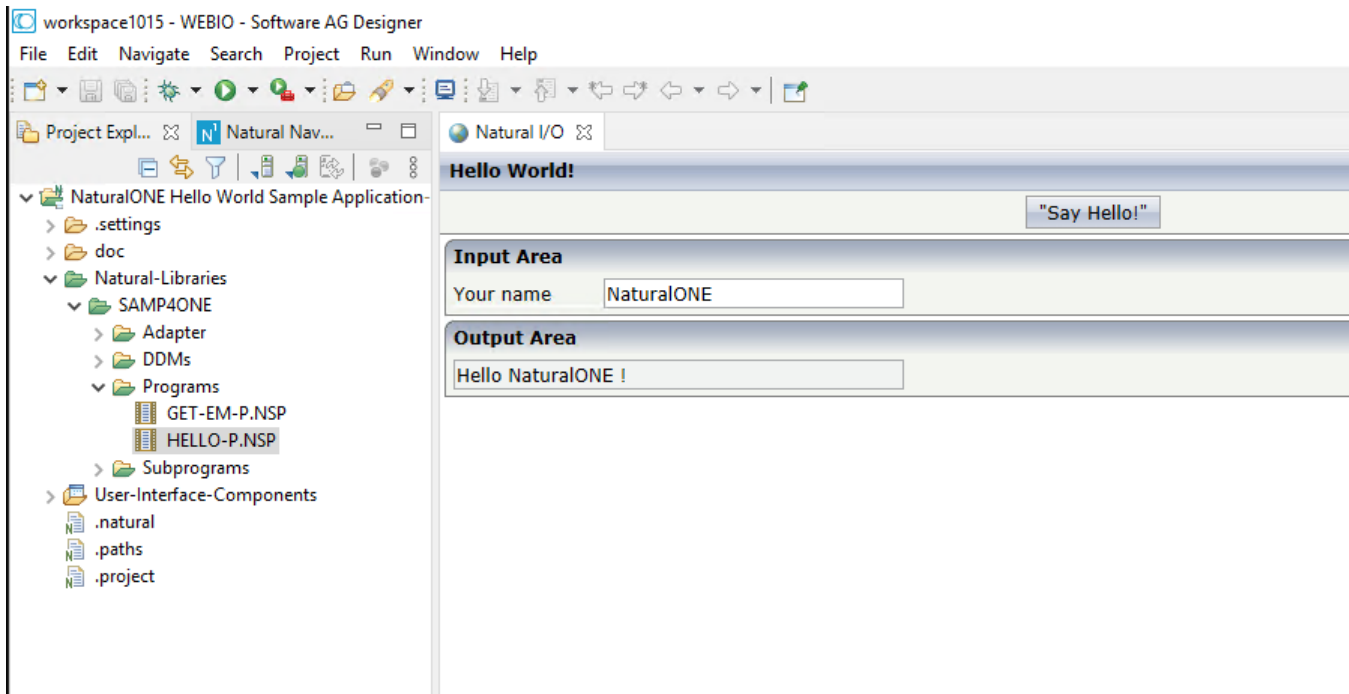
To do so, please select the Natural sample project and click the Update icon.



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. [Link.](#)

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:9.2.0.1
```

Software AG Registry:

```
docker run -d -p 4990:4990 -e ACCEPT_EULA=Y --name adabas-manager  
sagcr.azurecr.io/adabasmanager-ce:9.2.0.1
```

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

If you wish to view the log type this command:

```
docker logs adabas-manager
```

To launch Adabas Manager, enter the address "https://<host of the running container>:4990 " at the URL of a browser. The host of the running container can either be defined as a DNS name or through the IP address of the Docker environment.

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.

The screenshot shows the 'Host Configuration' dialog box in Adabas Manager. It has four tabs: 'Adabas (LUW) Admin', 'AMC', 'Adabas Audit', and 'Predict'. A green success message states 'Success adabas-db added successfully.' Below this is a table with the following data:

Connection Name	Hostname	Port	Enabled	Secured	AMN Auth	Alt. User	
adabas-db	172.17.0.4	8190	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	admin	:

The screenshot shows the 'Database List' page in Adabas Manager. It includes buttons for '+ New Database', 'Refresh List', and 'Create Report'. A timestamp indicates the list was last updated on 08/10/2021 at 18:26:24. Below is a table with the following data:

Database ID	Database Name	Connection Name	Status	Version	Start/Stop	Rename	Delete
12	GENERAL_DATABASE	adabas-ce	Online	7.0	■		

Database Overview - DB 12 (adabas-ce)

Database Status	Uptime	Active Users
Online	53m 4s	1

Space Allocation

ASSO (block size < 16 KB)	ASSO (block size ≥ 16 KB)	DATA	WORK
Allocated Size [MB] 61.00	Allocated Size [MB] 20.00	Allocated Size [MB] 100.00	Allocated Size [MB] 20.00
Free Space [MB] 57.49	Free Space [MB] 18.56	Free Space [MB] 39.09	
Free Space [%] 94.25	Free Space [%] 92.81	Free Space [%] 39.09	
Extents 2	Extents 1	Extents 1	

Three pie charts are shown below the table, each with a legend for 'Used' (blue) and 'Free' (grey). The first chart (ASSO < 16 KB) shows approximately 5% used space. The second chart (ASSO ≥ 16 KB) shows approximately 7% used space. The third chart (DATA) shows approximately 61% used space.

For further information, see the Description of the Adabas Manager Community Edition for Docker in Docker Hub or Software AG Official Registry.

12 How to restart Docker containers

It's worth noting, that if at any point in time the PC is shut down the docker containers are stopped but not automatically removed. Thus, a new container can't be started but the old one can't be used either.

Note: If a docker container is removed, all data within that container is lost. Make sure important data is pulled from those containers before removing the containers.

To restart a docker container in Linux, first if it isn't already the running process needs to be stopped. For this you use the following command.

```
docker stop <softwarename>
```

Afterwards, the Container must be removed with the command

```
docker rm <softwarename>
```

Once this is done, a new container using the same image can be started.

13 Troubleshooting Network Connectivity

13.1 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
```

13.2 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>
```