IIP-Ecosphere

Next Level Ecosphere for
Intelligent Industrial Production

Windows Platform Installation Guide Service Workshop

Gefördert durch:

Bundesministerium
für Wirtschaft
und Klimaschutz

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IIP-Ecosphere Platform Documentation

Introduction

- These slides are used to do the Service Workshop setup in Linux OS.
- The slides are divided into:
  1. Using pre-defined Docker image.
     a) Install Docker.
     b) Running the container.
     c) Using the pre-defined development environment.
  2. Full manual Installation of the platform
     a) Install the required setup (Prerequisites).
     b) Download and install the IDE Eclipse development environment.
     c) Install the IIP-Ecosphere platform.
     d) Start the IIP-Ecosphere platform.
     e) Stop the IIP-Ecosphere platform.

The pre-defined Docker image

Install Docker

Docker Engine Installation - step (1)

- If **Docker Engine v20.10.7** is not installed, then Install **Docker Desktop 3.4.0** which uses **Docker Engine v20.10.7** and all the prerequisites it may needs. Please enter the following comands into zour console:

```
- curl
https://desktop.docker.com/win/main/amd64/65384/Docker%%20Desktop%%20Installer.exe
-O DockerDesktopInstaller.exe
- rename "Docker%%20Desktop%%20Installer.exe" DockerDesktopInstaller.exe
- start /w "" "DockerDesktopInstaller.exe" install
```

Docker Engine Installation - step (2)

- You should install **Windows Sub system for Linux** (**WSL**), which is required for Docker in Windows, please see the Instructions to install **WSL** in Windows:

https://ubuntu.com/tutorials/install-ubuntu-on-wsl2-on-windows-10#1-overview

The pre-defined Docker image

Running the container

Running The Container

- Use the following command to pull the image and run it on your machine
  - docker run -p 6080:80 -v /dev/shm:/dev/shm iipecosphere/dev-container:0.1

The pre-defined Docker image

Using the pre-defined development environment

Development Environment

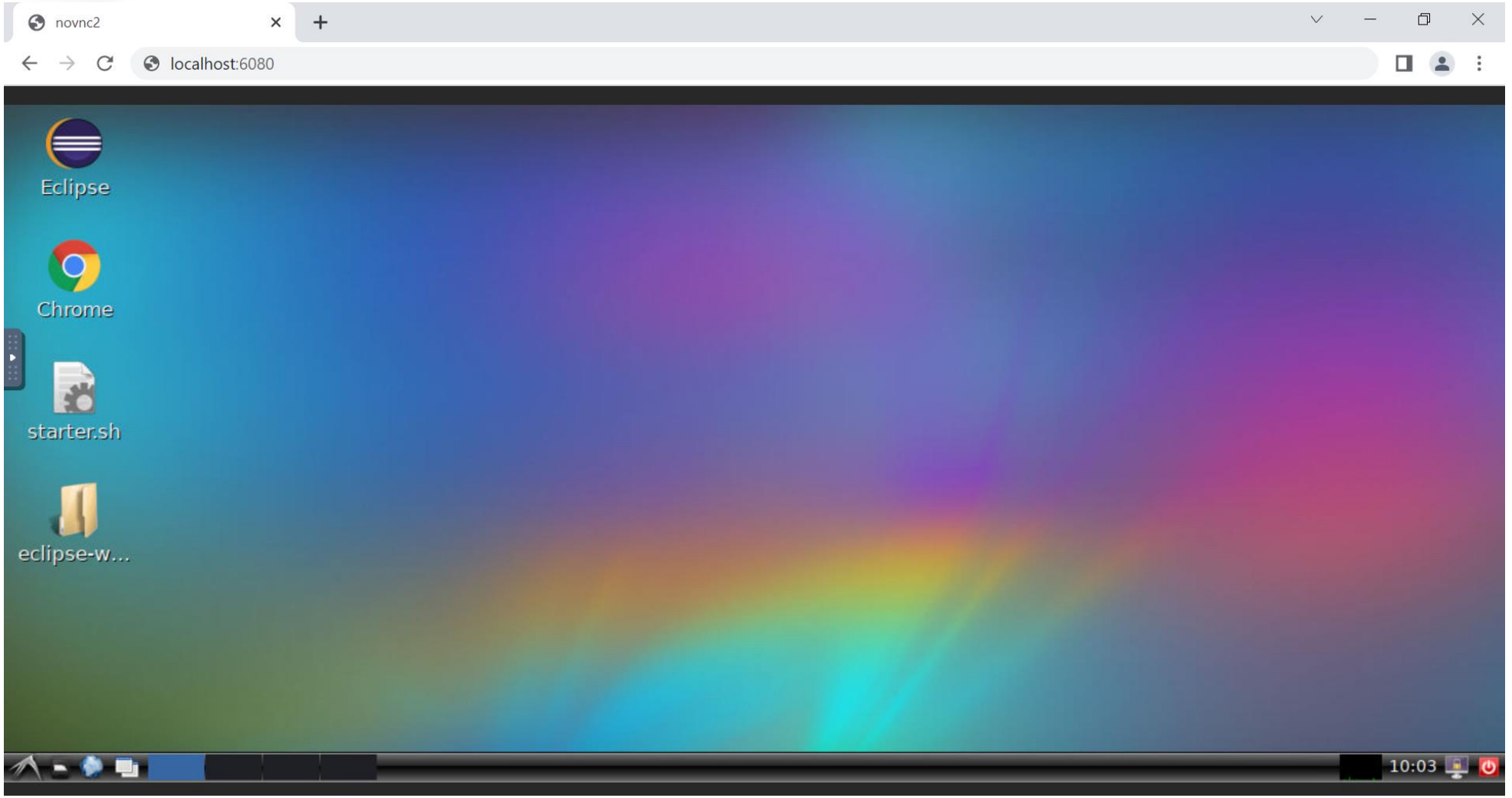
- To access the pre-defined working environment use any browser with the URL: **localhost:6080** OR replace the **localhost** with the **IP address** of the machine that run the container.

- You have IDE Eclipse environment install and ready to use with a workspace (**eclipse-workspace**) that has Impl.model project.

- You have platform install and running (the logs are in /root/platform/logs)

- You should have the following screen.

Development Environment



Full manual Installation of the platform

Install the required setup (Prerequisites)

Required Setup

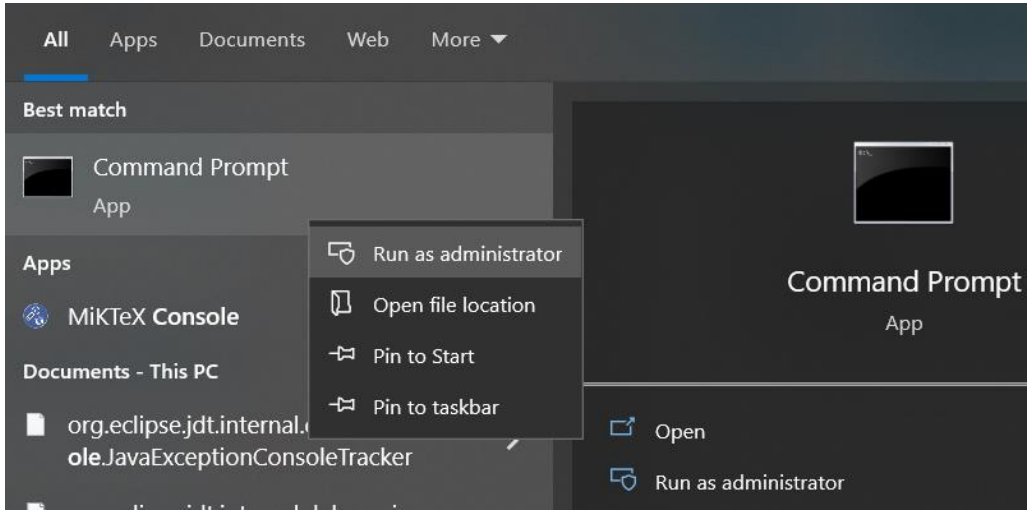
Notes:

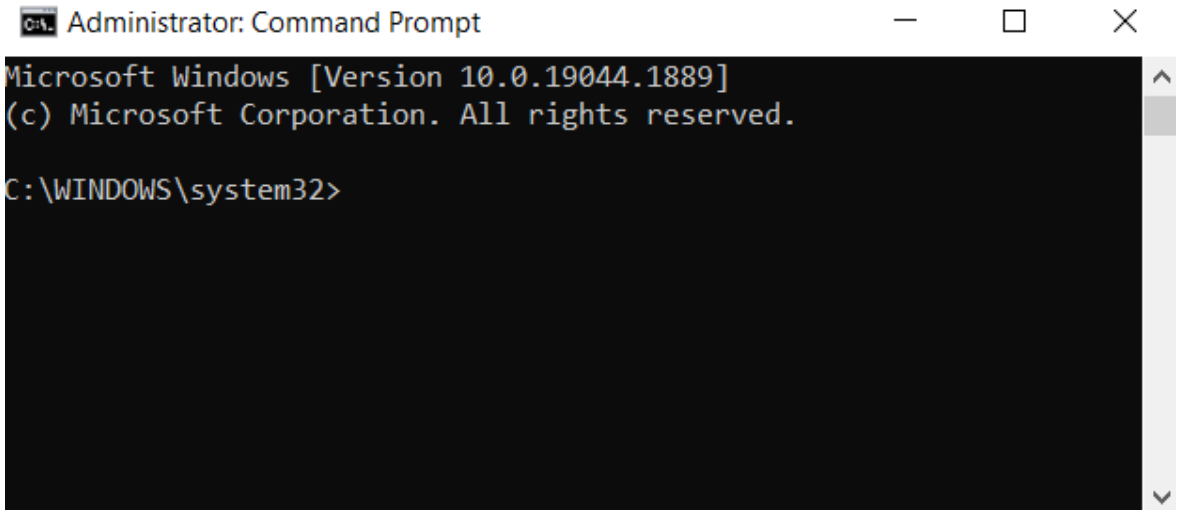
- Please ensure that you use the exact version numbers given for every software in this guide.

- Please do not use ”the latest” version of a given software, as these later versions maybe incompatible with the current IIP-Ecosphere platform build.

Required Setup - step (1)

- For the installation we will use the command line interface (CLI) or console.
- To open the console search for @Console@ in the Start menu.
- Please ensure that you run the console with Administrator rights (right/click and select ”Run as administrator”)





Required Setup - step (2)

- Please note that the current IIP-Ecosphere platform required Java **JDK 8, 11 or 13**, no other. In this guide we are installing **JDK 13**.
- If Java **JDK 13** is not installed, then install Java **JDK 13**, using the following CLI commands (enter the following lines in the console and after each press return):

Required Setup - step (3)

- curl https://download.java.net/openjdk/jdk13/ri/openjdk-13+33_windows-x64_bin.zip –O openjdk-13+33_windows-x64_bin.zip

- tar xzpvf openjdk-13+33_windows-x64_bin.zip
- setx /M JAVA_HOME "%cd%\jdk-13"
- SET JAVA_HOME=%cd%\jdk-13
- setx /M Path "%Path%;%JAVA_HOME%\bin"
- SET Path=%Path%;%JAVA_HOME%\bin

Required Setup - step (4)

- If **Maven 3.6.3** is not installed, then install Maven **3.6.3** by entering the following comands in your console:
  - `curl https://archive.apache.org/dist/maven/maven-3/3.6.3/binaries/apache-maven-3.6.3-bin.zip -O apache-maven-3.6.3-bin.zip`

  - `tar xzpvf apache-maven-3.6.3-bin.zip`
  - `setx /M MAVEN_HOME "%cd%\apache-maven-3.6.3“`
  - `SET MAVEN_HOME=%cd%\apache-maven-3.6.3`
  - `setx /M Path "%Path%;%MAVEN_HOME%\bin“`
  - `SET Path=%Path%;%MAVEN_HOME%\bin`

Required Setup - step (5)

- If **Python v3.9** is not installed, then Install **Python v3.9** by entering the following comand into your console:

  ```
  - curl https://www.python.org/ftp/python/3.9.6/python-3.9.6-amd64.exe -O python-3.9.6-amd64.exe

  - start /w "" "python-3.9.6-amd64.exe" install
  ```

- If you want to use a UI (User Interface), there are several applications like Angular, JavaScript… etc. Please check the handbook for more information.

Required Setup - step (6)

- If **Python v3.9** is installed add the requirements by running:
  - `python -m pip install scikit-learn==0.23.2`
  - `python -m pip install numpy==1.20.1`
  - `python -m pip install pickle==4.0`
  - `python -m pip install pyflakes`

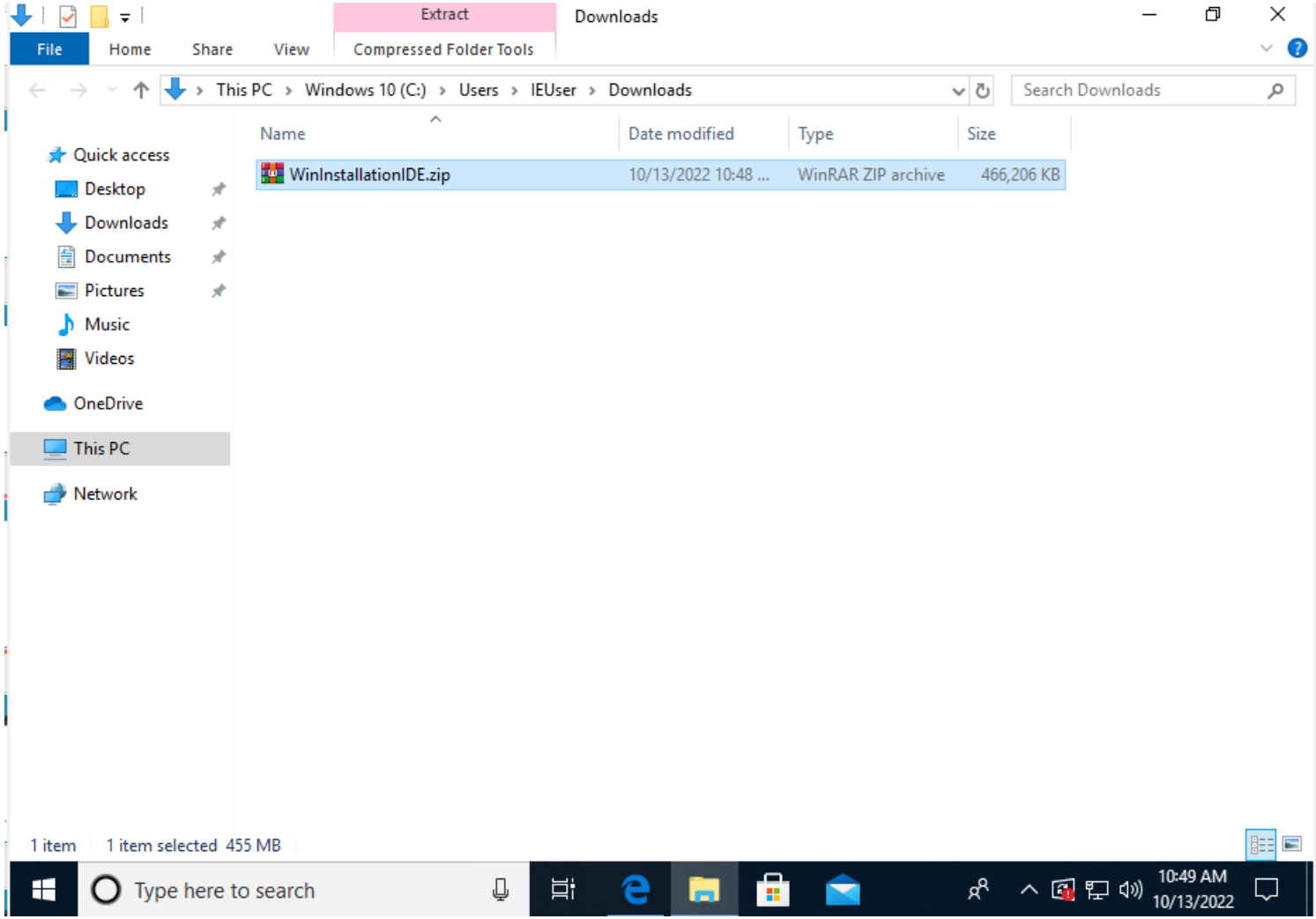
Setup the IDE Eclipse environment

Setup the IDE Eclipse environment

- For the purpose of the Service Workshop, we have prepared the projects and the examples for Eclipse IDE - with exact Eclipse version (**Eclipse 2021-03, version 4.19.0**) provided by the link in next slide.
- Any other Java-enabled IDE like Netbeans may do, but this requires manual work.
- The Eclipse provided by the link in next slide is compiled one with the required plugins (like checkstyle) fitting the required JDK for the platform.

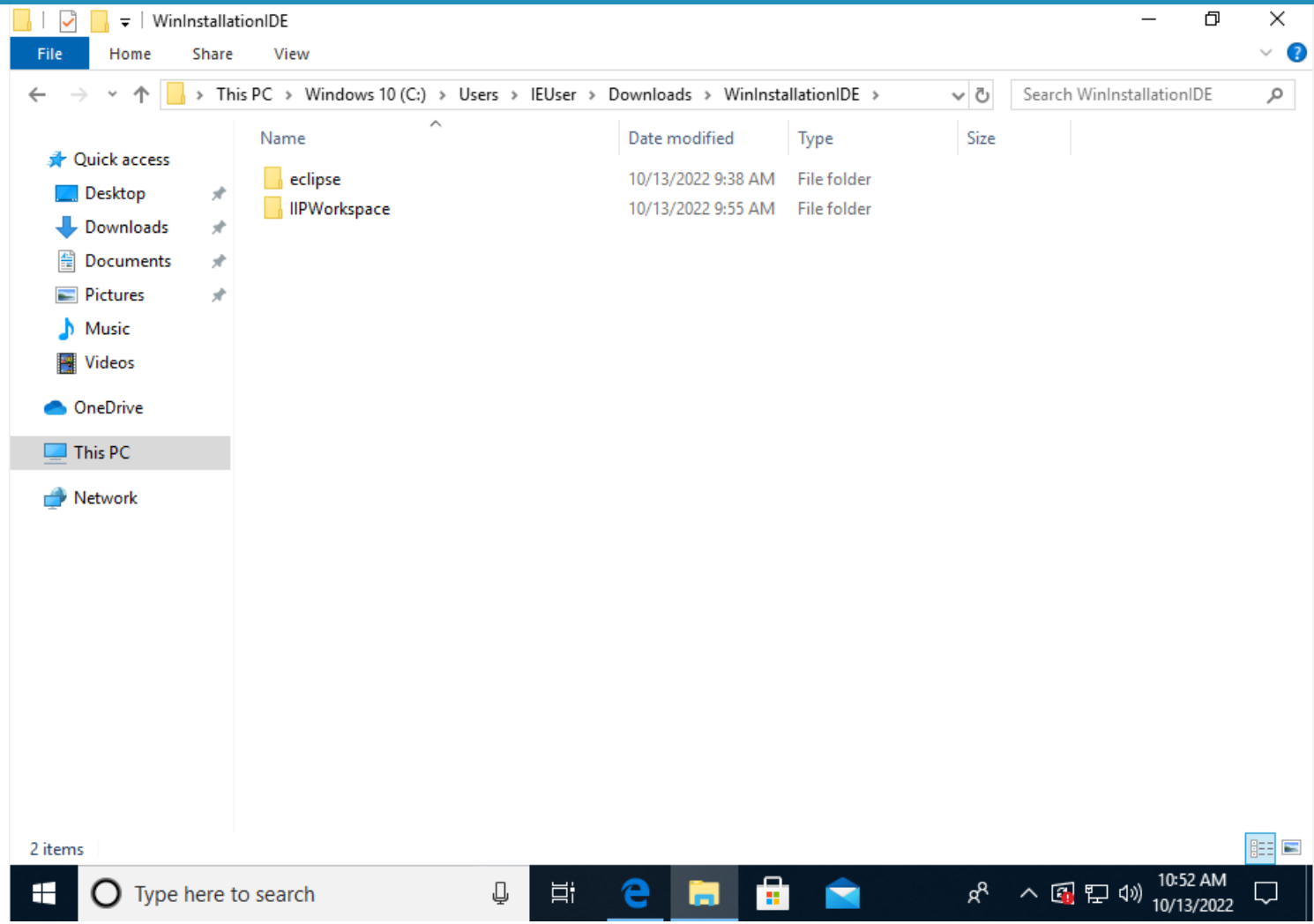
Setup the IDE Eclipse environment

- Click the following link to download a tar file (**WinInstallationIDE.tar.gz**) that contains the IDE Eclipse with the workspace to use:
- https://sync.academiccloud.de/index.php/s/2XnAi5tfiADD7MP
- Extract the Zip file.



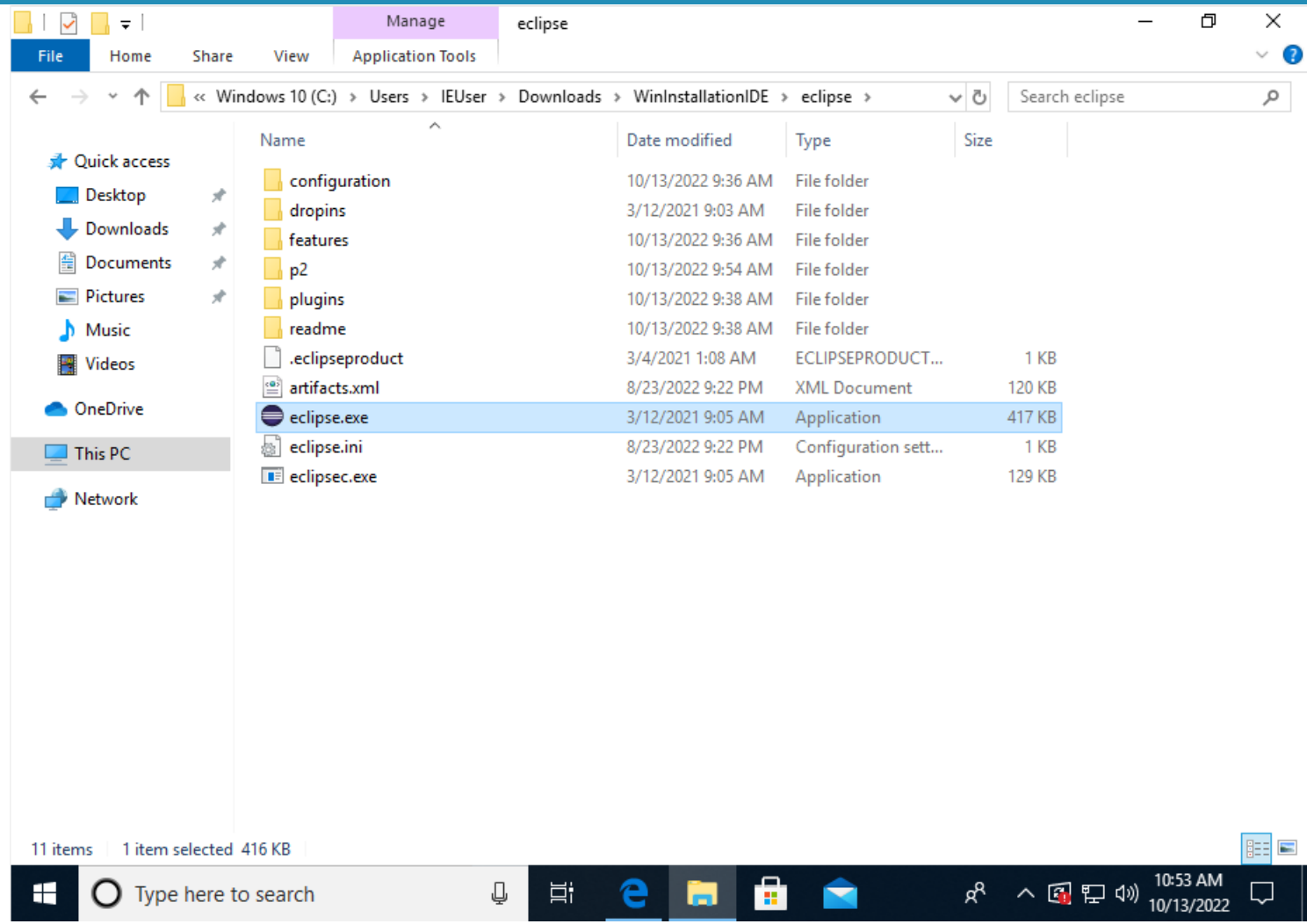
Setup the IDE Eclipse environment

- There are two folders.
  - Eclipse (folder)
  - IIPWorkspace (folder)



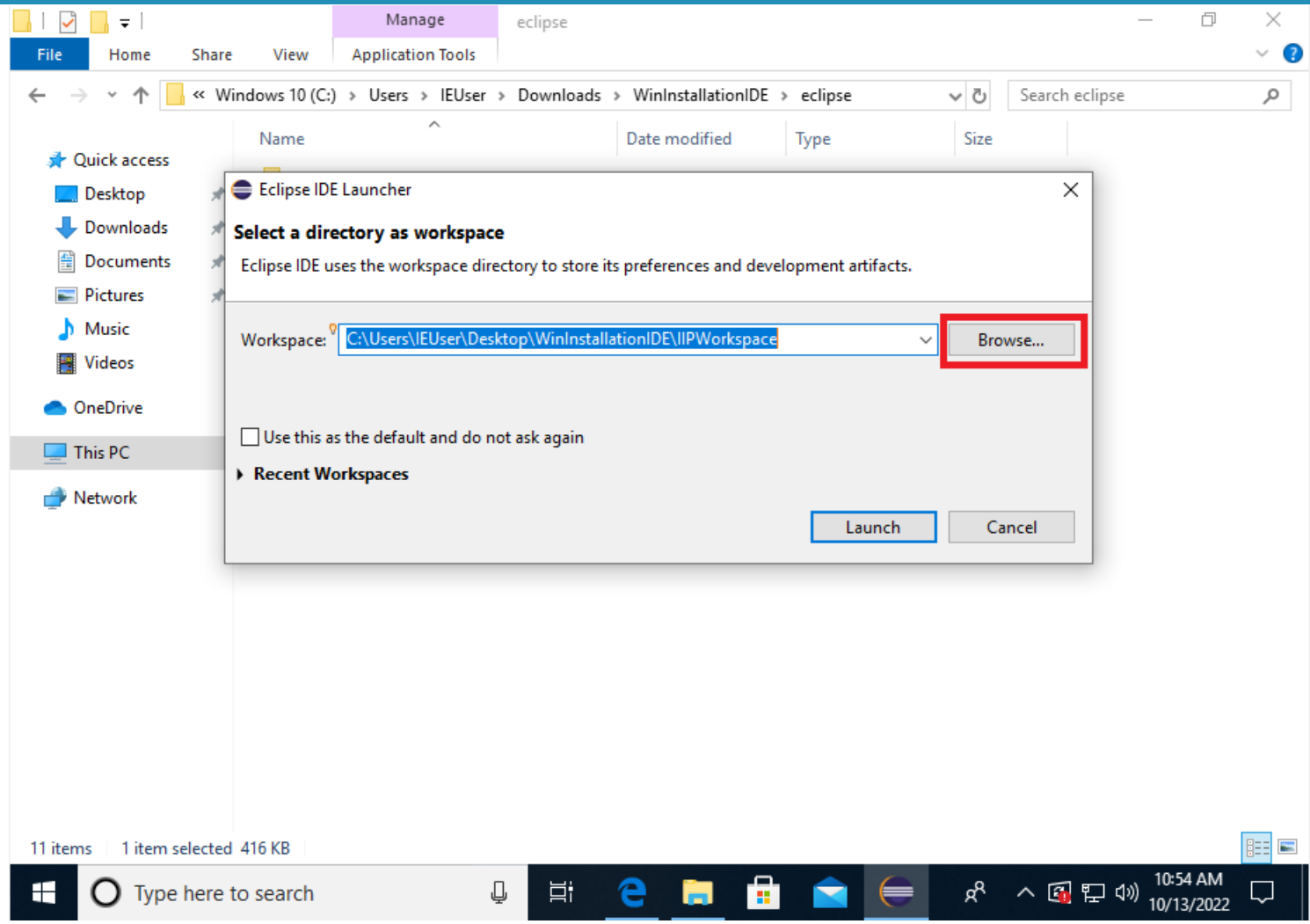
Setup the IDE Eclipse environment

- Inside eclipse folder, open eclipse application.



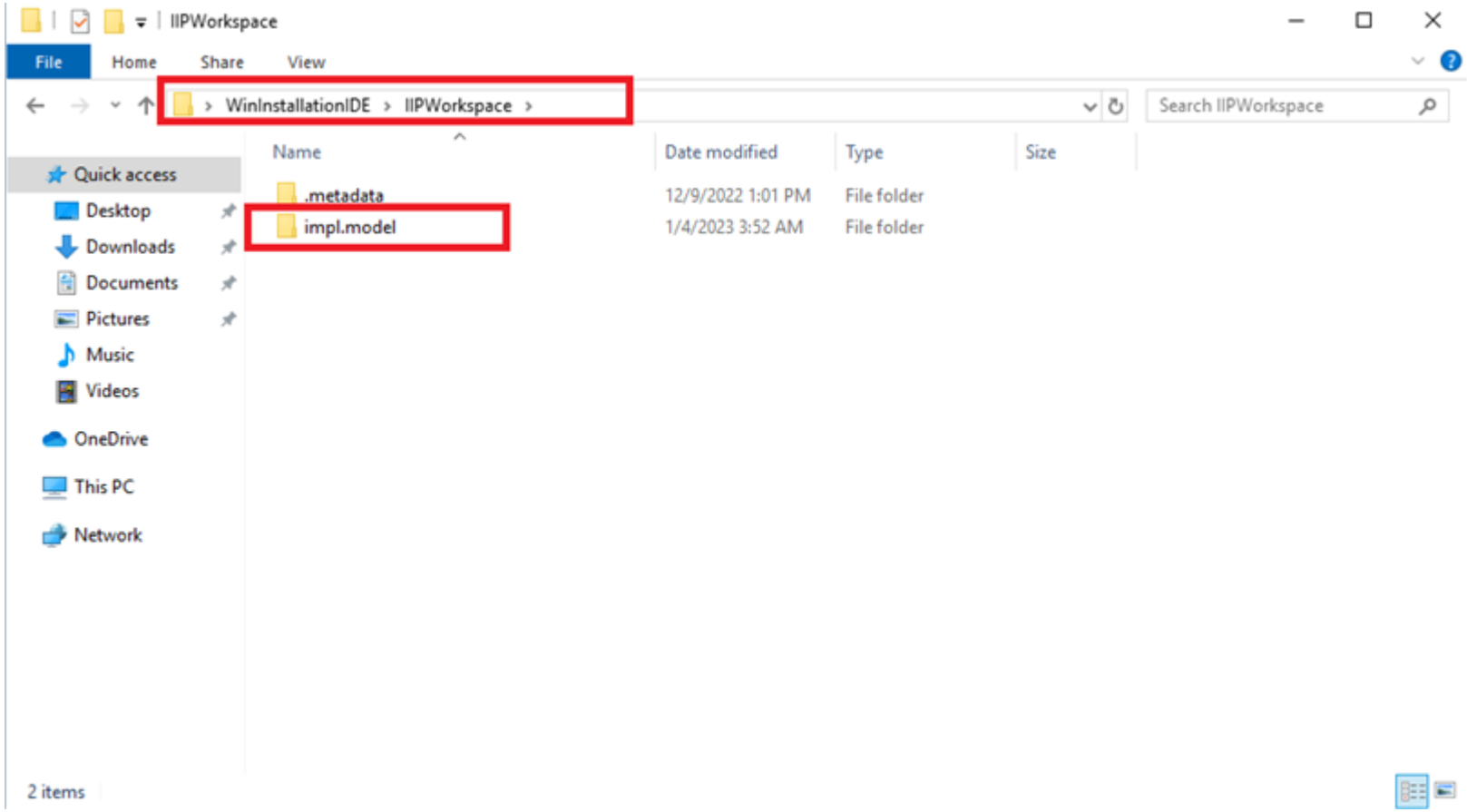
Setup the IDE Eclipse environment

- Browse to IIPWorkspace in downloaded folder.



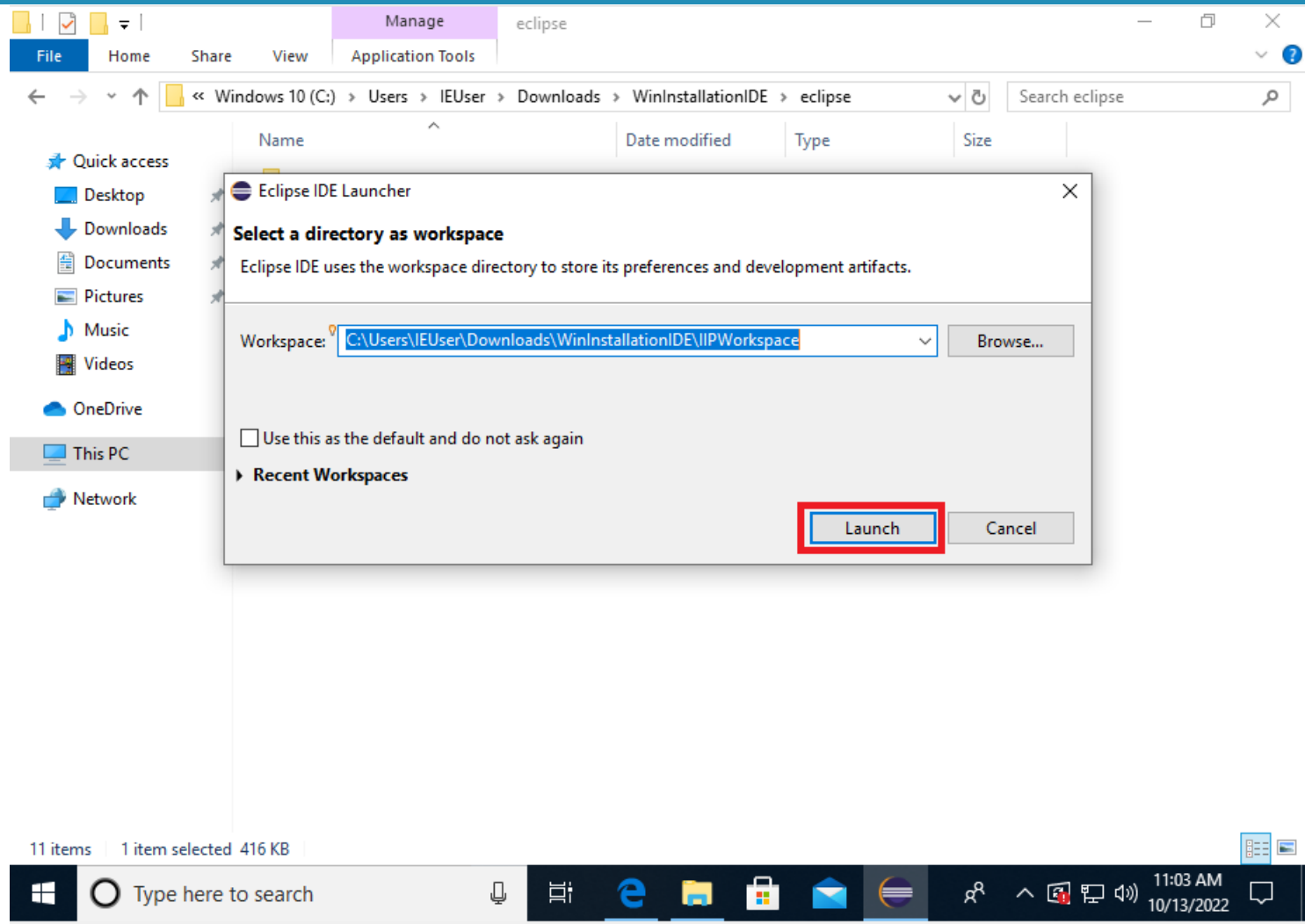
Setup the IDE Eclipse environment

- You should see the following projects in that directory.
- Click open.



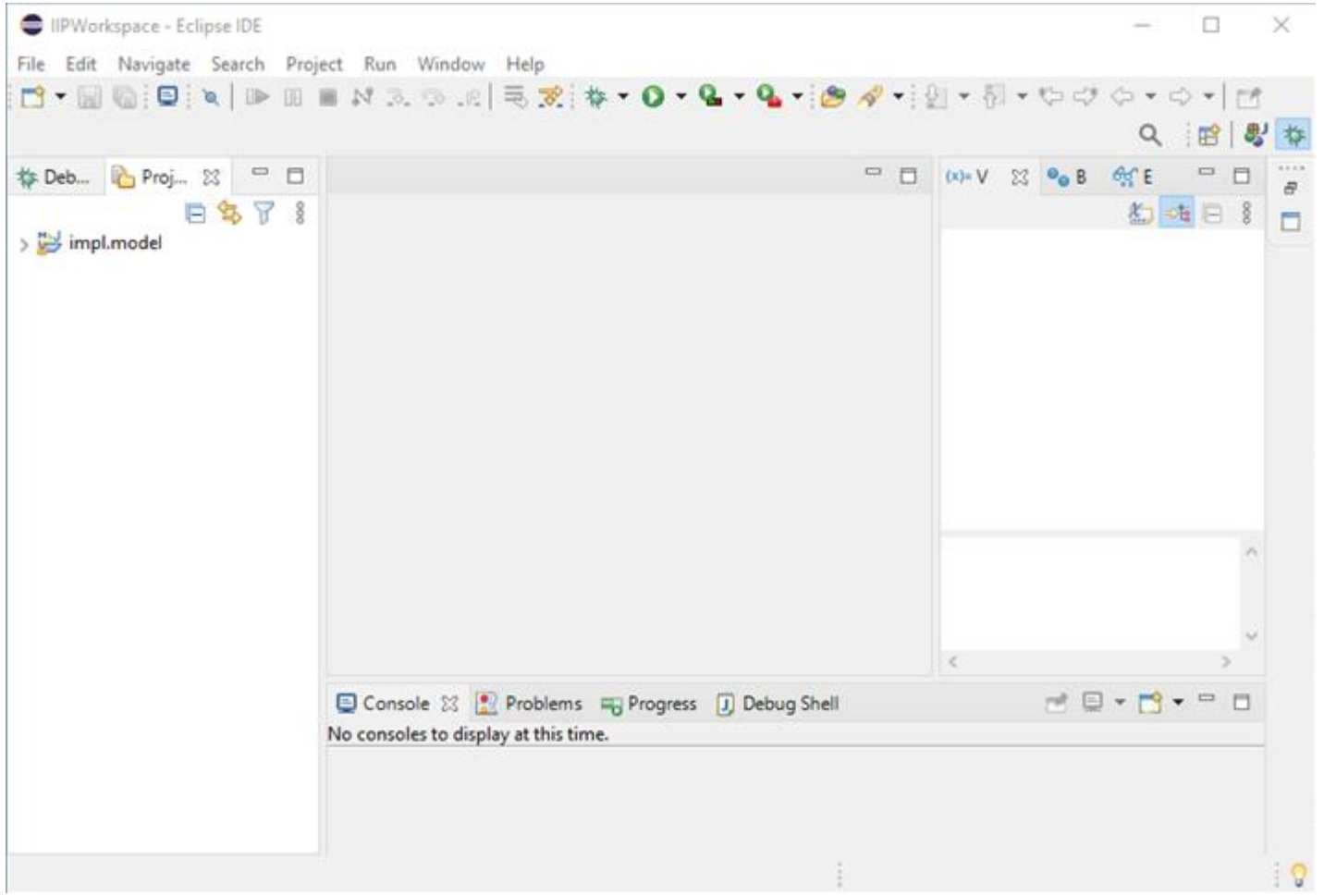
Setup the IDE Eclipse environment

- Click Launch.



Setup the IDE Eclipse environment

- Wait until all projects are build and ready to use.



Install the platform

Platform Installation - step (1)

- Create an empty folder and name it (for example) “Install”, as usual via entering the following comands into your console:
  - `mkdir Install`
  - `cd Install`
- Download the Install-Package and unpack it (again, via Console)
  - `curl https://jenkins-2.sse.uni-hildesheim.de/view/IIP-Ecosphere/job/IIP_Install/lastSuccessfulBuild/artifact/platform/tools/Install/install.tar.gz -o install.tar.gz`

  - `tar xzpvf install.tar.gz`

Platform Installation - step (1)

Administrator: Command Prompt

```
Microsoft Windows [Version 10.0.19044.1889]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd..

C:\Windows>cd..

C:\>mkdir Install

C:\>cd Install

C:\Install>curl https://jenkins-2.sse.uni-hildesheim.de/view/IIP-Ecosphere/job/IIP_Install/lastSuccessfulBuild/artifact/install.tar.gz -O install.tar.gz
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  101k  100  101k    0     0  1358k      0 --:--:-- --:--:-- --:--:-- 1376k
curl: (6) Could not resolve host: install.tar.gz

C:\Install>tar xzpvf install.tar.gz
x container/EdgeEcsSvc/wrapper_script.sh
x container/EdgeServiceMgr/wrapper_script.sh
x container/createAppContainer.sh
x container/createEcsContainer.sh
x container/createEdgeEcsRuntimeContainer.sh
x container/createEdgeEcsSvcContainer.sh
x container/createEdgeServiceMgrContainer.sh
x container/fullPlatform/platform/wrapper_script.sh
x container/runAppContainer.sh
x container/runEcsContainer.sh
x container/saveAppContainer.sh
x container/saveEcsContainer.sh
x container/saveEdgeEcsRuntimeContainer.sh
```

Platform Installation - step (2)

- Modify the IP address for the platform in the configuration file (src/main/easy/InstallTest.ivml) to the IP address of your PC (where you have installed the Platform)

- You can type“ipconfig” in the console to see you PC’s IP address

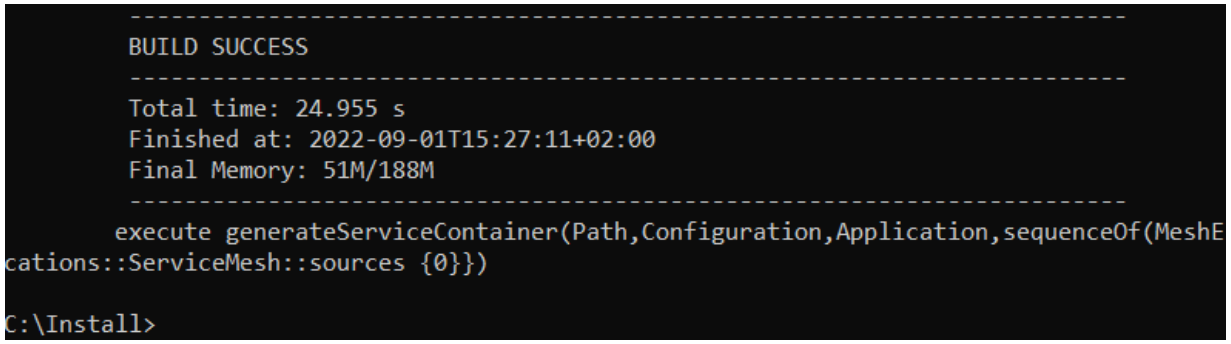
```
project InstallTest {

    import IIPEcosphere;
    import DataTypes;

    annotate BindingTime bindingTime = BindingTime::compile to .;

    String platformServer = "147.172.177.142";

    // ------------ component setup ------------------

    serializer = Serializer::Json;
    // serviceManager, containerManager are already defined

    aasServer = {
        schema = AasSchema::HTTP,
```

```
C:\Install>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

   Connection-specific DNS Suffix  . : sse.local
   Link-local IPv6 Address . . . . . : fe80::808:886d:366:400c%19
   IPv4 Address. . . . . . . . . . . : 147.172.177.142
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 147.172.177.254
```

Platform Installation - step (3)

- Instantiate the platform: Execute these comands in the “Install” folder (the folder you installed the platform in)
  - `mvn install`

- This will take a while, once finished it looks like this:



- Now the platform is installed, the script files are created and ready to start.

Start The Platform

Start The Platform

- There are two possible aways to the run the platform:
  - Local: One machine working as platfrom and device at the same time.
  - Distributed: One machine working as platform, another mahine(s) working as device(s)

Start The Platform Local - Step (1)

- Open a new console
- You can do so by holding shift and clicking on your console icon in the windows task bar

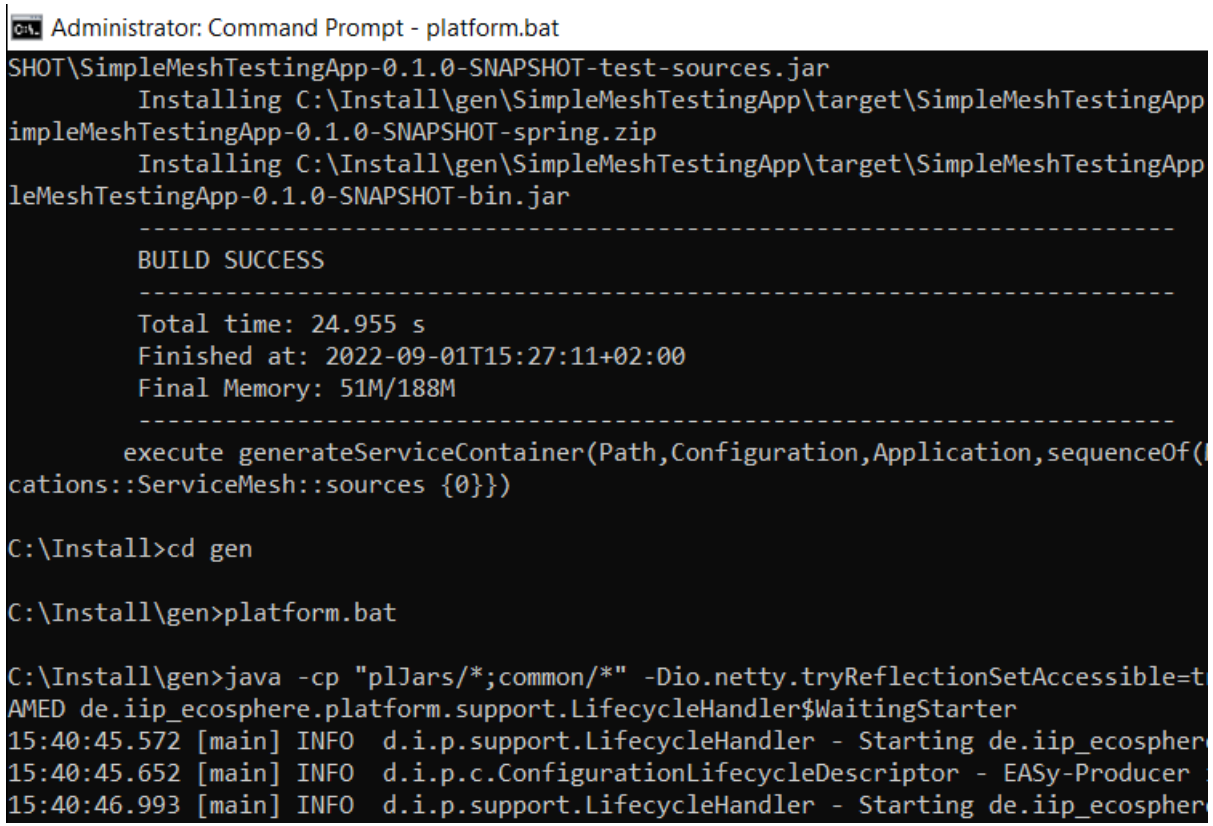
- The broker scripts and files are in “Install/gen/broker” folder, change to this path and run the following batch script to start it>
  - `broker.bat`

```
C:\Install>
C:\Install>cd gen

C:\Install\gen>cd broker

C:\Install\gen\broker>broker.bat
[Broker] BRK-1006 : Using configuration : N/A
[Broker] BRK-1001 : Startup : Version: 8.0.2 Build: 22840e
[Broker] BRK-1010 : Platform : JVM : Oracle Corporation ve
[Broker] BRK-1011 : Maximum Memory : Heap : 8,543,797,248
[Broker] BRK-1017 : Process : PID : 11052
[Broker] BRK-1002 : Starting : Listening on TCP port 8883
[Broker] BRK-1004 : Qpid Broker Ready
```

Start The Platform Local - Step (2)

- Now return to your previous console and start the actual platform.
- The platform scripts and files are in the “Install/gen/” folder, run the following script to start it:

  - `platform.bat`



Start The Platform Local - Step (3)

- To make the platform machine working as resource run the following scripts in zet another new console:
  - `ecs.bat`
  - `serviceMgr.bat`
- Or just run the following script (share the same memory)
  - `ecsServiceMgr.bat`

Start The Platform Local - Step (4)

- To start the command line interface for the platform run the following script
  - `-cli.bat`
- Again, the above scripts are in the “Install/gen” folder

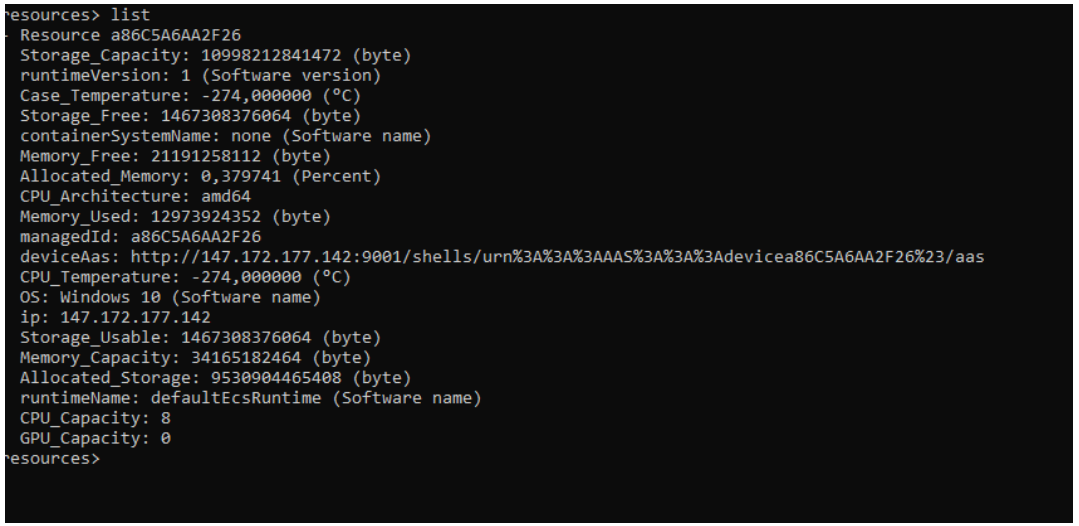
```
C:\Install\gen>cli

C:\Install\gen>java -cp "plJars/*;common/*" -Dio.nett
--add-opens java.base/jdk.internal.misc=ALL-UNNAMED -
m.platform.Cli
16:01:20.524 [main] INFO  d.i.p.s.resources.ResourceL
16:01:20.529 [main] INFO  d.i.p.s.resources.ResourceL
16:01:20.561 [main] INFO  d.i.p.s.s.SemanticIdResolve
16:01:20.563 [main] INFO  d.i.p.s.resources.ResourceL
16:01:20.568 [main] INFO  d.i.p.s.s.SemanticIdResolve
16:01:20.572 [main] INFO  d.i.p.s.resources.ResourceL
IIP-Ecosphere, interactive platform command line 0.4.
AAS server: http://147.172.177.142:9001
AAS registry: http://147.172.177.142:9002/registry
Type "help" to see commands and their description.
>
```

Start The Platform Distributed - Step (1)

- Copy the following files and folders from the platform server (the PC you installed the platform on) to the PC/Device that is to be added to the platform as a resource:
  - gen\ecsJars (folder)
  - gen\ecsSVCJars(folder)
  - gen\broker (folder)
  - gen\svcJars (folder)
  - gen\ecs.bat (file)
  - gen\serviceMgr.bat (file)
  - gen\ecsServiceMgr.bat (file)

Start The Platform Distributed - Step (2)

- To add the new PC/Device as resource in the platform run the following scripts on the new PC/Device, each one in separate terminal
  - `ecs.bat`
  - `serviceMgr.bat`
- Or just run the following script in separate terminal (share the same memory)
  - `ecsServiceMgr.bat`
- If everything worked fine, then PC/Device should be listed as a platform resource



Add a Windows Edge device to the platform

- The difference between a device and an Edge devices is (in case that Edge device only supports Java 8)
  - Copy the following files (not the files from slide 31) from the platform server to the Edge device and run them
    - gen\ecs8.bat instead of gen\ecs.bat
    - gen\serviceMgr8.bat instead of gen\serviceMgr.bat
    - gen\ecsServiceMgr8.bat instead of gen\ ecsServiceMgr.bat

Stop The Platform

Stop The Platform

- Stopping the platform:
- Type Crtl-C on all the open shells (CLIs) to stop them and clean the resources in the reverse order we opened (started) them.
- If asked to quit (Y/N), type Y

Kontakt

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