Windows Platform Installation Guide Service Workshop

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IIP-Ecosphere Platform Documentation

Introduction

- These slides are used to do the Service Workshop setup in Windows OS.
- The slides are divided into:
  1. Install the required setup (Prerequisites).
  2. Download and install IDE Eclipse development environment.
  3. Install the IIP-Ecosphere platform.
  4. Start the IIP-Ecosphere platform.
  5. Stop the IIP-Ecosphere platform.

Introduction

- For the sake of the Service Workshop you should follow this order:
    1. Install prerequisites that should be use by the IIP-Ecosphere platform and IDE development environment.
    2. Download the IDE Eclipse + Workspace for the Workshop.
    3. Install the IIP-Ecosphere platform to test the App developed in the Workshop.
    4. Start and Stop the IIP-Ecosphere platform to validate the installation, and use it in the Workshop (more details in the Workshop).

# 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")
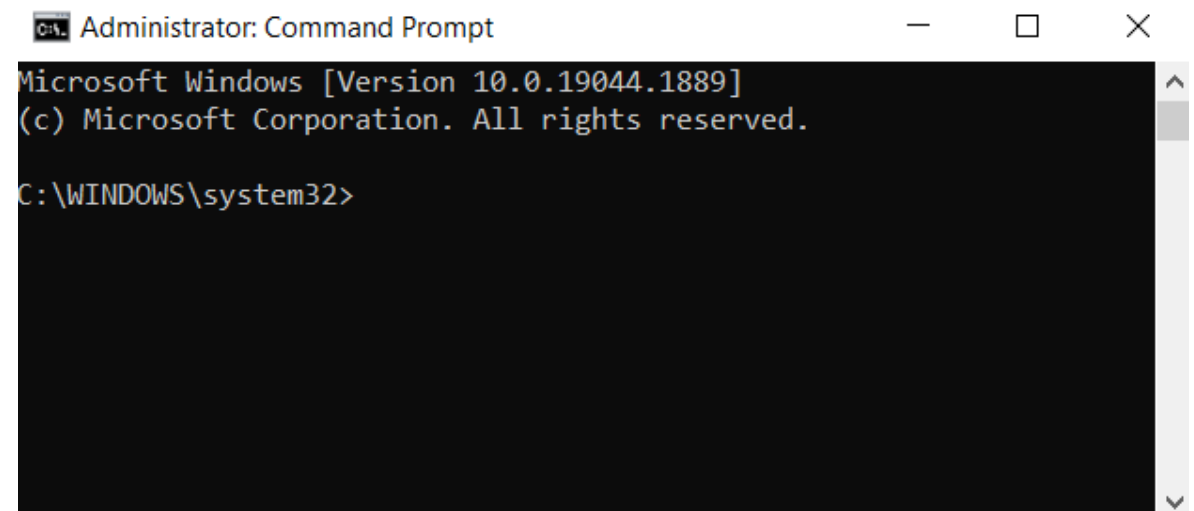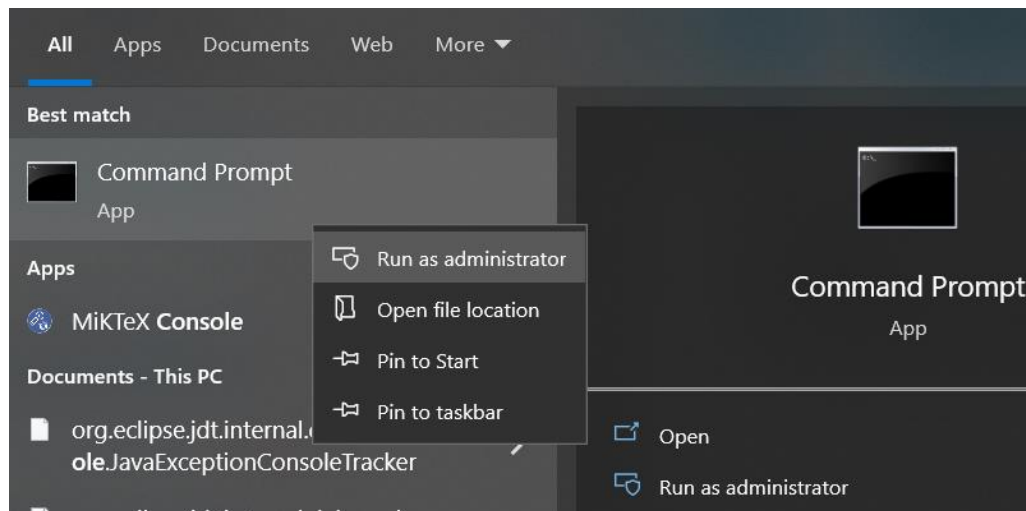
Required Setup - step (2)

- 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):

```
-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
```

- 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
  ```

- 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.

- 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`

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.

- 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/WNC2iHNX2cMs2lm
- Extract the Zip file.
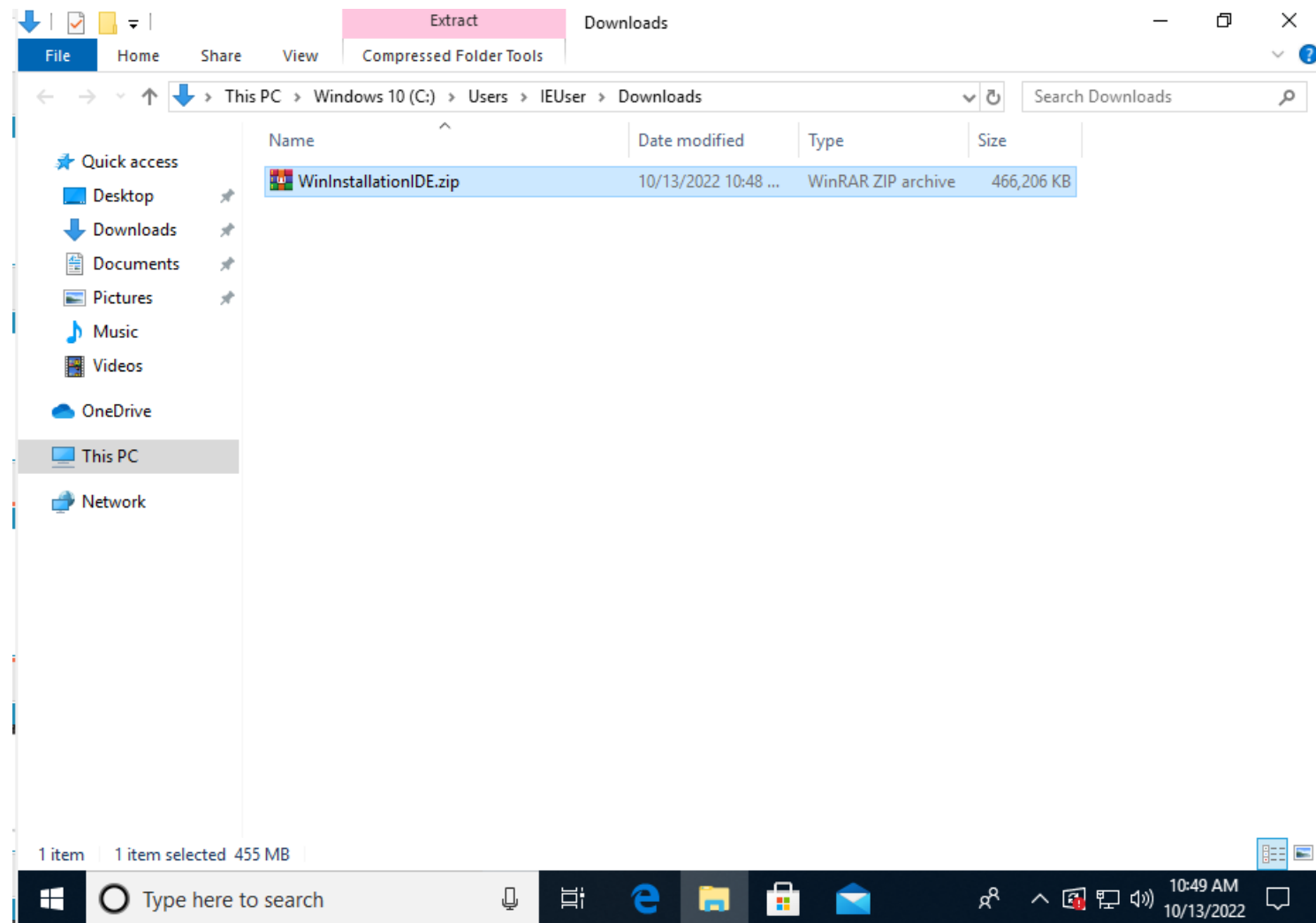
- There are two folders.
  - Eclipse (folder)
  - IIPWorkspace (folder)
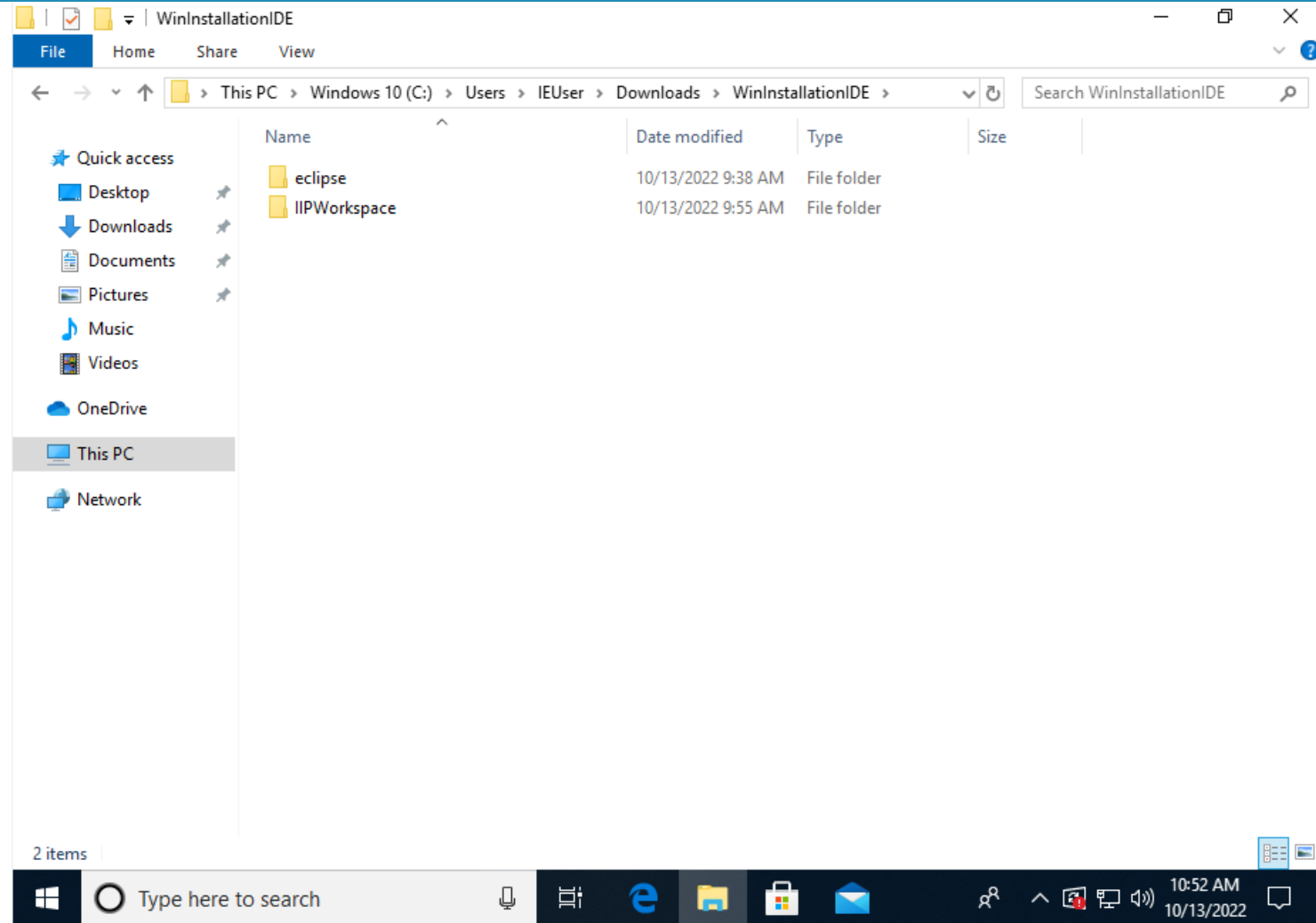
Setup the IDE Eclipse environment

- Inside eclipse folder, open eclipse application.
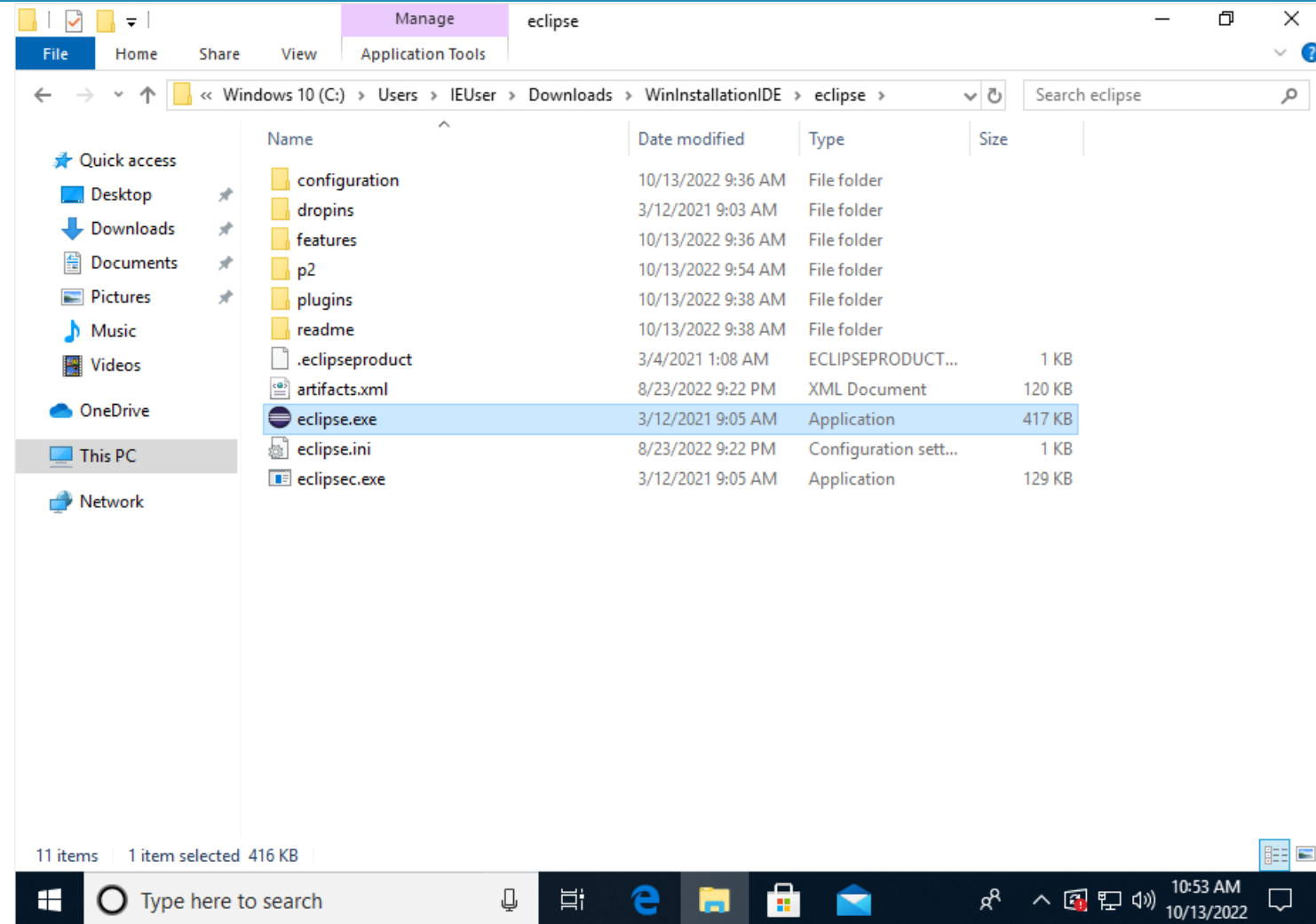
Setup the IDE Eclipse environment

- Browse to IIPWorkspace in downloaded folder.
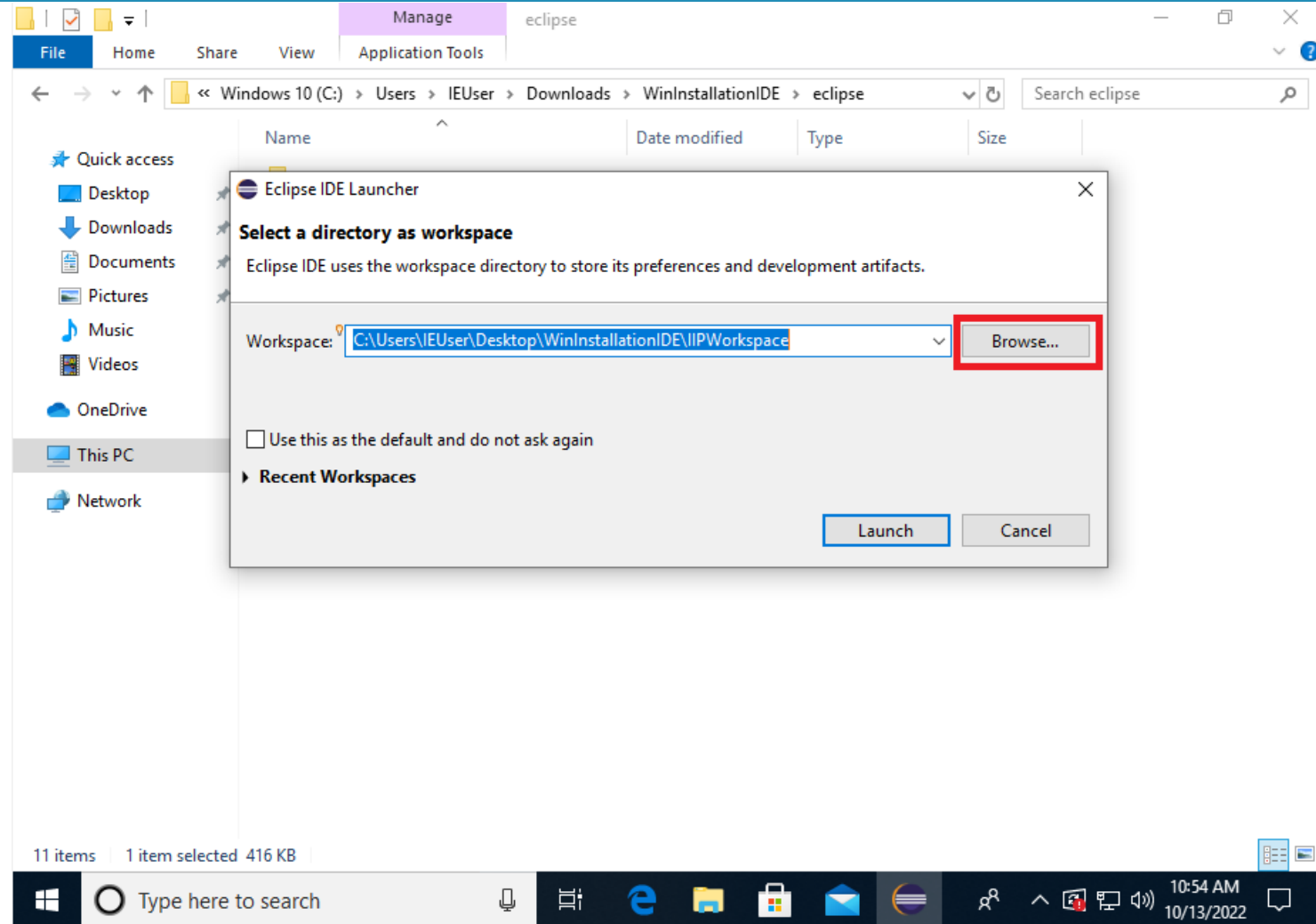
Setup the IDE Eclipse environment

- You should see the following projects in that directory.
- Click open.
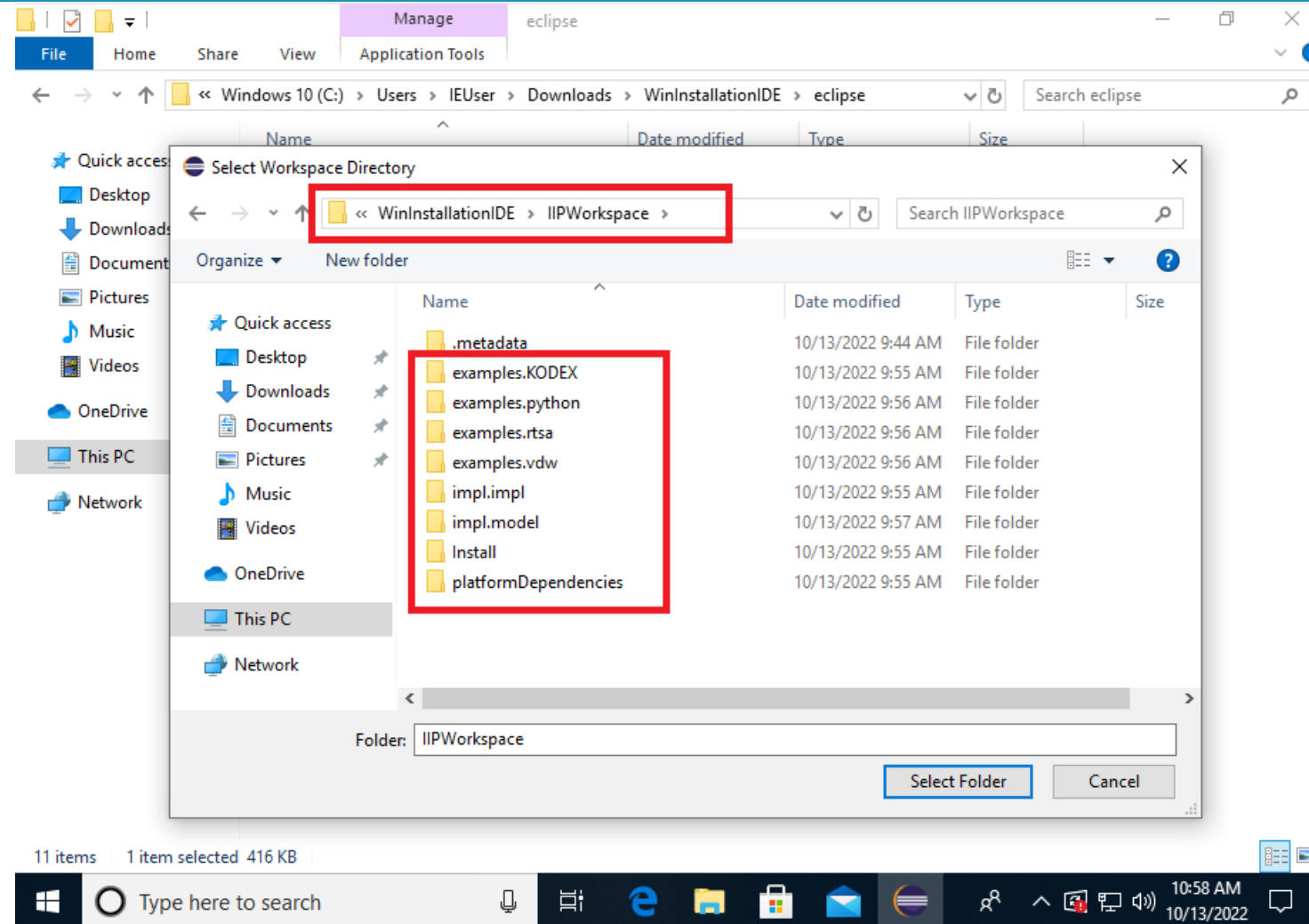
Setup the IDE Eclipse environment

- Click Launch.

Setup the IDE Eclipse environment

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

Install the platform

Docker Engine Installation - step (1)

- **Please note that you should install Docker Engine in case to want to run the container version of the platform, else Skip Docker Installation. Please check the handbook for more information.**

- 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:

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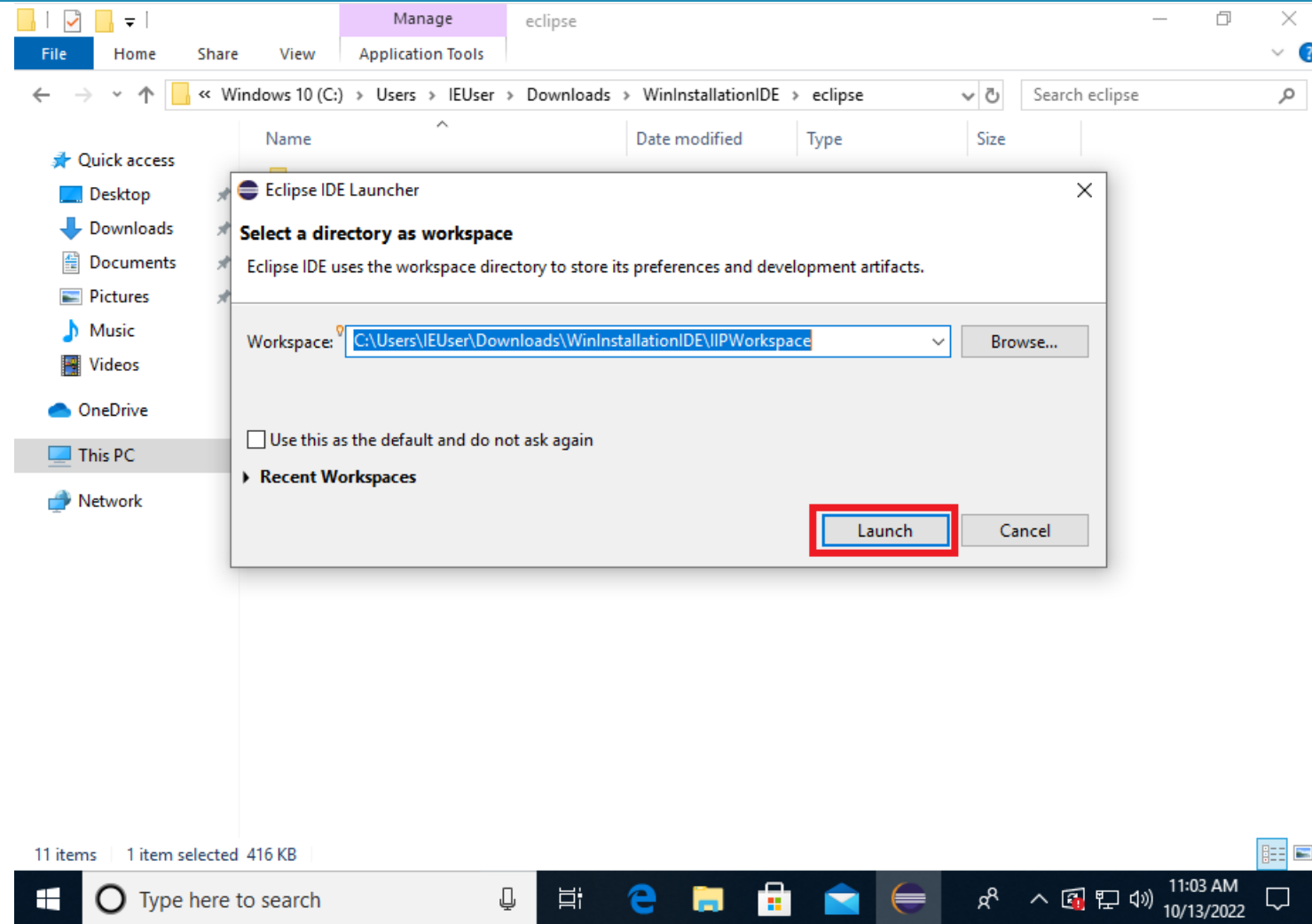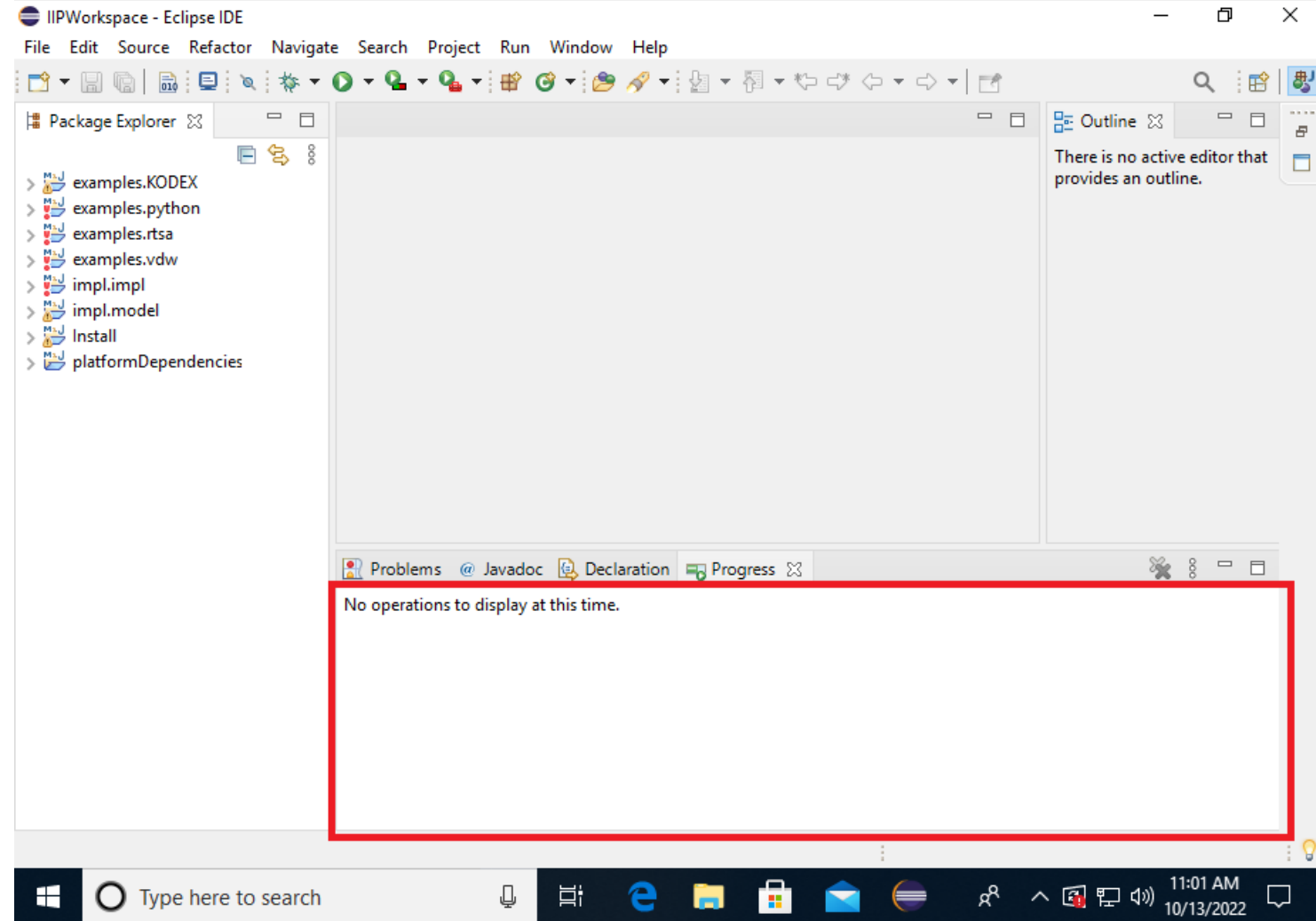  - curl
  https://desktop.docker.com/win/main/amd64/65384/Docker%%20Desktop%%20Installer.exe
  -O DockerDesktopInstaller.exe
  - rename "Docker%%20Desktop%%20Installer.exe" DockerDesktopInstaller.exe
  - start /w "" "DockerDesktopInstaller.exe" install
  ```

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

- 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/install.tar.gz `-O install.tar.gz`

  - `tar xzpvf install.tar.gz`

- Install platform dependencies

  - `cd platformDependencies`

  - `mvn install`

  - `cd ..`

- Obtain platform bootstrap packages

  - `mvn package -DskipTests`

Platform Installation - step (4)

```
C:\Install>cd platformDependencies

C:\Install\platformDependencies>mvn install
[INFO] Scanning for projects...
[INFO]
[INFO] -----------< de.iip-ecosphere.platform:InstallDependencies >------------
[INFO] Building InstallDependencies 0.4.0-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
Downloading from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosph
Downloaded from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosphe
```

```
C:\Install\platformDependencies>cd..

C:\Install>mvn package -DskipTests
[INFO] Scanning for projects...
[INFO]
[INFO] -----------------< de.iip-ecosphere.platform:Install >------------------
[INFO] Building Install 0.4.0-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
Downloading from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosph
Downloaded from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosphe
Downloading from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosph
Downloaded from SSE: https://projects.sse.uni-hildesheim.de/qm/maven/de/iip-ecosphe
```

- 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

```
1  project InstallTest {
2
3      import IIPEcosphere;
4      import DataTypes;
5
6      annotate BindingTime bindingTime = BindingTime::compile to .;
7
8      String platformServer = "147.172.177.142";
9
10     // ------------ component setup ------------------
11
12     serializer = Serializer::Json;
13     // serviceManager, containerManager are already defined
14
15     aasServer = {
16         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
```

- Instantiate the platform: Execute these comands in the "Install" folder (the folder you installed the platform in)
  - `mvn exec:java`

```
C:\Install>mvn exec:java
[INFO] Scanning for projects...
[INFO]
```

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

```
------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------
Total time: 24.955 s
Finished at: 2022-09-01T15:27:11+02:00
Final Memory: 51M/188M
------------------------------------------------------------
execute generateServiceContainer(Path,Configuration,Application,sequenceOf(MeshE
cations::ServiceMesh::sources {0}})

C:\Install>
```

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

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)

- 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
```

- 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
  ```



```
SHOT\SimpleMeshTestingApp-0.1.0-SNAPSHOT-test-sources.jar
        Installing C:\Install\gen\SimpleMeshTestingApp\target\SimpleMeshTestingApp
impleMeshTestingApp-0.1.0-SNAPSHOT-spring.zip
        Installing C:\Install\gen\SimpleMeshTestingApp\target\SimpleMeshTestingApp
leMeshTestingApp-0.1.0-SNAPSHOT-bin.jar
        ------------------------------------------------------------------------
        BUILD SUCCESS
        ------------------------------------------------------------------------
        Total time: 24.955 s
        Finished at: 2022-09-01T15:27:11+02:00
        Final Memory: 51M/188M
        ------------------------------------------------------------------------
        execute generateServiceContainer(Path,Configuration,Application,sequenceOf(
cations::ServiceMesh::sources {0}})

C:\Install>cd gen

C:\Install\gen>platform.bat

C:\Install\gen>java -cp "plJars/*;common/*" -Dio.netty.tryReflectionSetAccessible=t
AMED de.iip_ecosphere.platform.support.LifecycleHandler$WaitingStarter
15:40:45.572 [main] INFO  d.i.p.support.LifecycleHandler - Starting de.iip_ecospher
15:40:45.652 [main] INFO  d.i.p.c.ConfigurationLifecycleDescriptor - EASy-Producer
15:40:46.993 [main] INFO  d.i.p.support.LifecycleHandler - Starting de.iip_ecospher
```

- 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`

- 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.
>
```

- **Please note that you should execute all the steps in "Required setup (Prerequisites)" and the first 3 steps in "Platform Installation" on each device.**

- 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)

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

```
resources> list
- Resource a86C5A6AA2F26
  Storage_Capacity: 10998212841472 (byte)
  runtimeVersion: 1 (Software version)
  Case_Temperature: -274,000000 (°C)
  Storage_Free: 1467308376064 (byte)
  containerSystemName: none (Software name)
  Memory_Free: 21191258112 (byte)
  Allocated_Memory: 0,379741 (Percent)
  CPU_Architecture: amd64
  Memory_Used: 12973924352 (byte)
  managedId: a86C5A6AA2F26
  deviceAas: http://147.172.177.142:9001/shells/urn%3A%3A%3AAAS%3A%3A%3Adevicea86C5A6AA2F26%23/aas
  CPU_Temperature: -274,000000 (°C)
  OS: Windows 10 (Software name)
  ip: 147.172.177.142
  Storage_Usable: 1467308376064 (byte)
  Memory_Capacity: 34165182464 (byte)
  Allocated_Storage: 9530904465408 (byte)
  runtimeName: defaultEcsRuntime (Software name)
  CPU_Capacity: 8
  GPU_Capacity: 0
resources>
```

- The difference between a PC/ pc like 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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