



**IIP-Ecosphere**

Next Level Ecosphere for  
Intelligent Industrial Production



# Linux 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 Engine v20.10.7**, may be needed
  - `sudo apt-get update -y`
  - `sudo apt-get install \`  
`ca-certificates \`  
`curl \`  
`gnupg \`  
`lsb-release -y`

# Docker Engine Installation - step (2)

- If **Docker Engine v20.10.7** is not installed, then Install **Docker Engine v20.10.7**, may be needed
  - `sudo mkdir -p /etc/apt/keyrings`
  - `curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg`
  - `echo \`  
    `"deb [arch=$(dpkg --print-architecture) signed-`  
    `by=/etc/apt/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu`  
    `\`  
    `$(lsb_release -cs) stable" | sudo tee`  
    `/etc/apt/sources.list.d/docker.list > /dev/null`

# Docker Engine Installation - step (3)

- If **Docker Engine v20.10.7** is not installed, then Install **Docker Engine v20.10.7**, may be needed
  - `sudo apt-get update -y`
  - `sudo apt-get install docker-ce=5:20.10.7~3-0~ubuntu-focal  
docker-ce-cli=5:20.10.7~3-0~ubuntu-focal containerd.io  
docker-compose-plugin -y`



# 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`
- You should have the following screen.





# Running The Container

```
2023-01-04 09:47:39,611 CRIT Supervisor is running as root. Privileges were not dropped because no user is specified in the con
fig file. If you intend to run as root, you can set user=root in the config file to avoid this message.
2023-01-04 09:47:39,611 INFO Included extra file "/etc/supervisor/conf.d/platform.conf" during parsing
2023-01-04 09:47:39,611 INFO Included extra file "/etc/supervisor/conf.d/supervisord.conf" during parsing
2023-01-04 09:47:39,614 INFO RPC interface 'supervisor' initialized
2023-01-04 09:47:39,615 CRIT Server 'unix_http_server' running without any HTTP authentication checking
2023-01-04 09:47:39,615 INFO supervisord started with pid 11
2023-01-04 09:47:40,622 INFO spawned: 'nginx' with pid 13
2023-01-04 09:47:40,623 INFO spawned: 'web' with pid 14
2023-01-04 09:47:40,624 INFO spawned: 'platform' with pid 15
2023-01-04 09:47:40,626 INFO spawned: 'xvfb' with pid 16
2023-01-04 09:47:40,627 INFO spawned: 'wm' with pid 17
2023-01-04 09:47:40,629 INFO spawned: 'lxpanel' with pid 18
2023-01-04 09:47:40,631 INFO spawned: 'pcmanfm' with pid 19
2023-01-04 09:47:40,637 INFO spawned: 'xllvnc' with pid 20
2023-01-04 09:47:40,653 INFO spawned: 'novnc' with pid 23
2023-01-04 09:47:40,837 INFO Listening on http://localhost:6079 (run.py:87)
2023-01-04 09:47:41,674 INFO success: nginx entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,676 INFO success: web entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: platform entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: xvfb entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: wm entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: lxpanel entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: pcmanfm entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: xllvnc entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
2023-01-04 09:47:41,677 INFO success: novnc entered RUNNING state, process has stayed up for > than 1 seconds (startsecs)
```



# The pre-defined Docker image

Using the pre-defined development  
environment

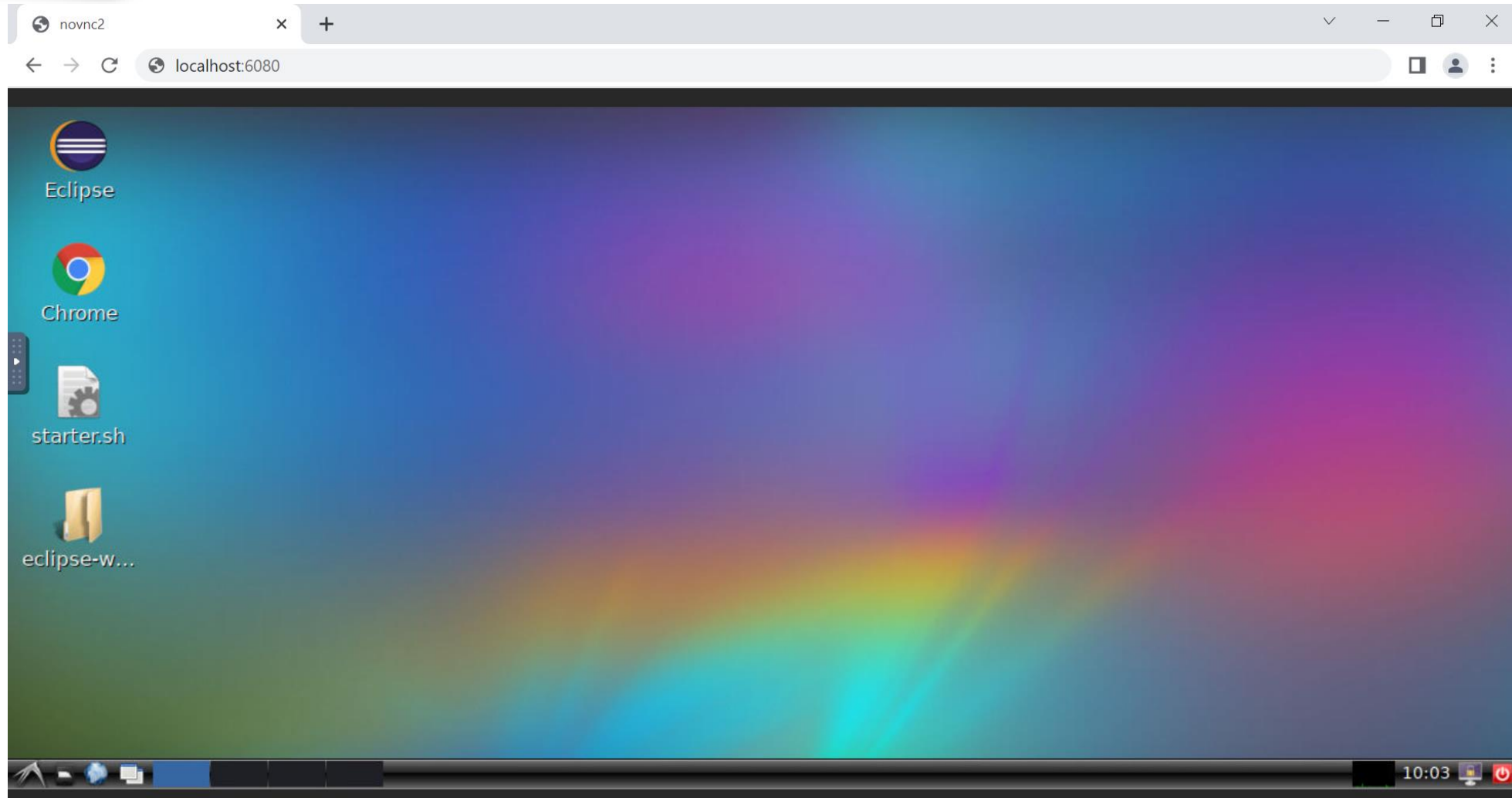
# Development Environment

- 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 the platform install and running (the logs are in /root/platform/logs)
- You should have the following screen.



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# 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)

- **Please note that you should run the commands in root.**
- Update all of your packages for Linux
  - `sudo apt-get update`
- Install unzip
  - `sudo apt install unzip -y`
- 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**
  - `sudo apt install openjdk-13-jdk-headless -y`
- If **Maven 3.6.3** is not installed, then install **Maven 3.6.3**
  - `sudo apt install maven -y`

## Required Setup - step (2)

- If **Python v3.9** is not installed, then Install **Python v3.9**
  - `sudo apt update -y`
  - `sudo apt install software-properties-common -y`
  - `sudo echo | add-apt-repository ppa:deadsnakes/ppa`
  - `sudo apt update -y`
  - `sudo apt install python3.9 -y`
- 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 (3)

- If **Python v3.9** is installed add the requirements by running:
  - python3 -m pip install scikit-learn==0.23.2
  - python3 -m pip install numpy==1.20.1
  - python3 -m pip install pickle==4.0
  - python3 -m pip install pyflakes



# Setup the IDE Eclipse environment



# Setup the IDE Eclipse environment

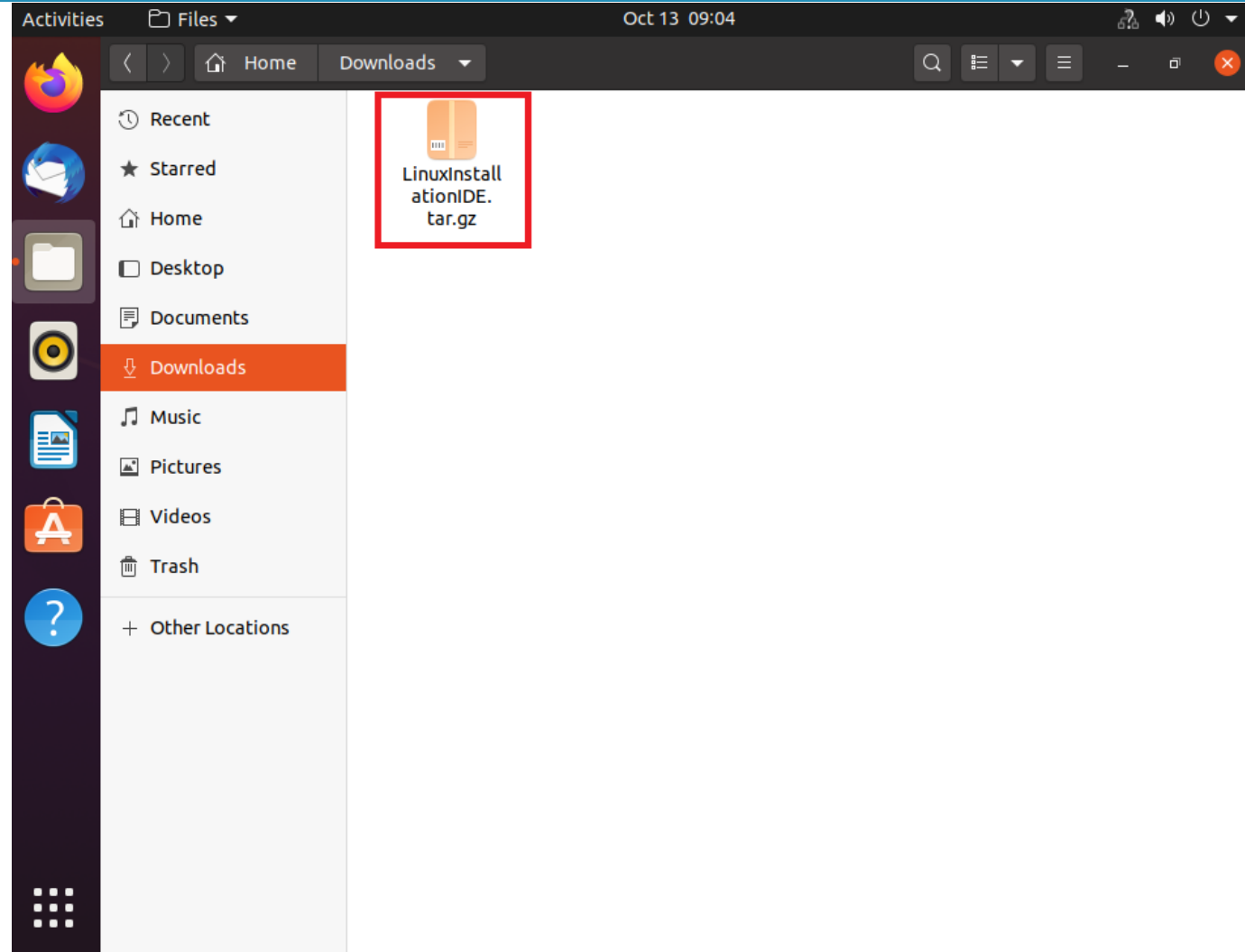
- For the purpose of the Service Workshop, we have prepared the projects and the examples for Eclipse IDE - with exact Eclipse version (**Eclipse 2021-03, version 4.19.0**) provided by the link in next slide.
- Any other Java-enabled IDE like Netbeans may do, but this requires manual work.
- The Eclipse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



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# Setup the IDE Eclipse environment

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

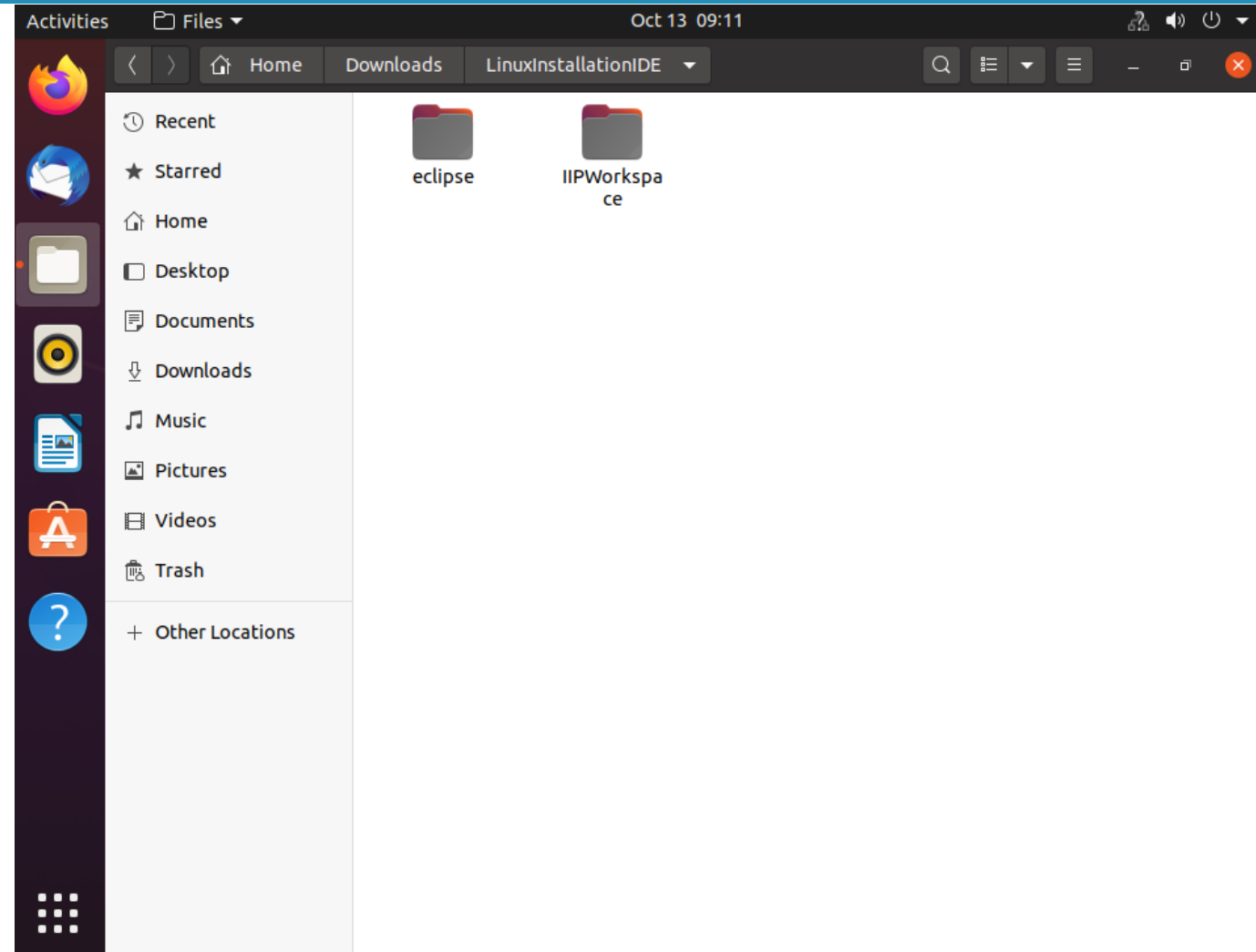




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# Setup the IDE Eclipse environment

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

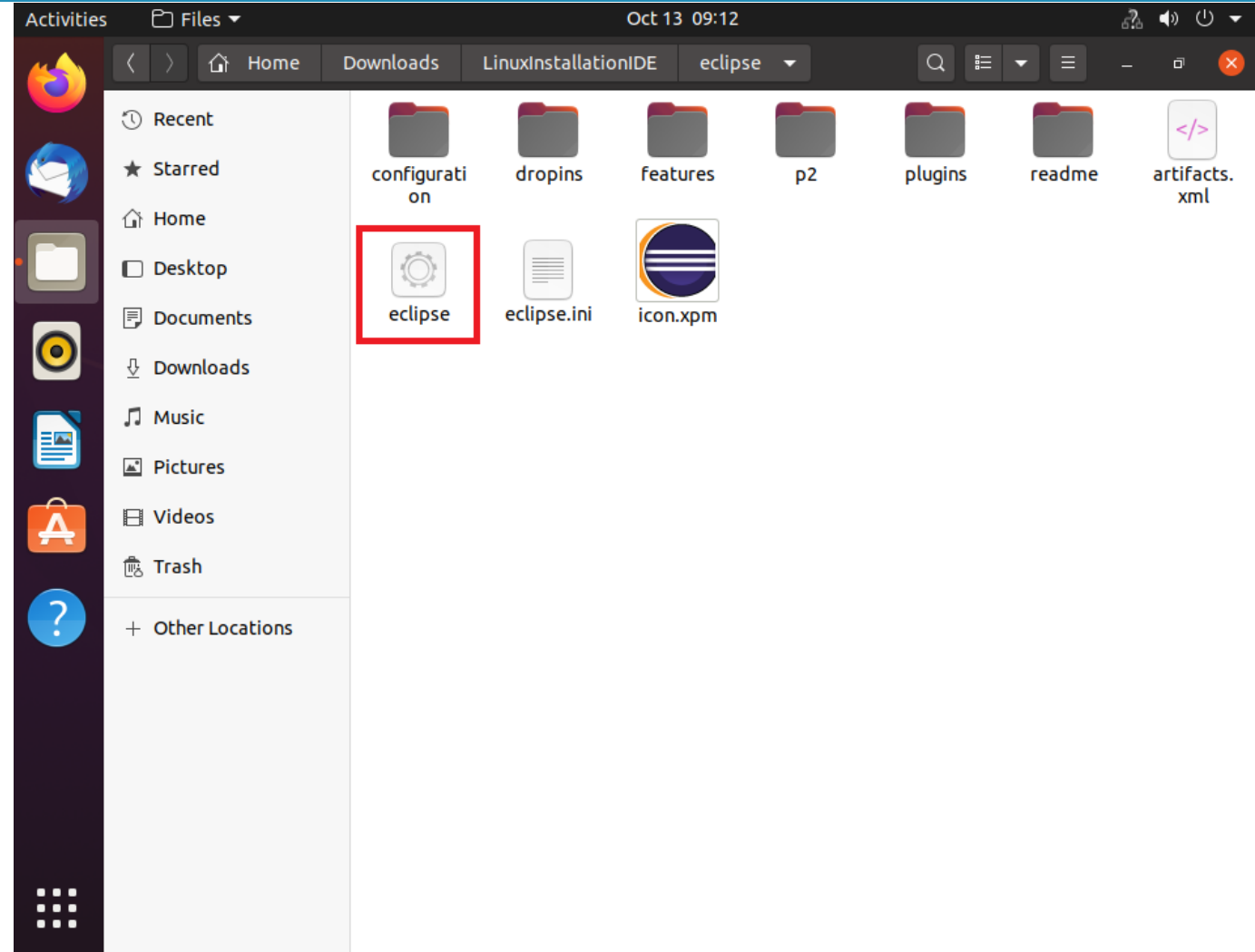




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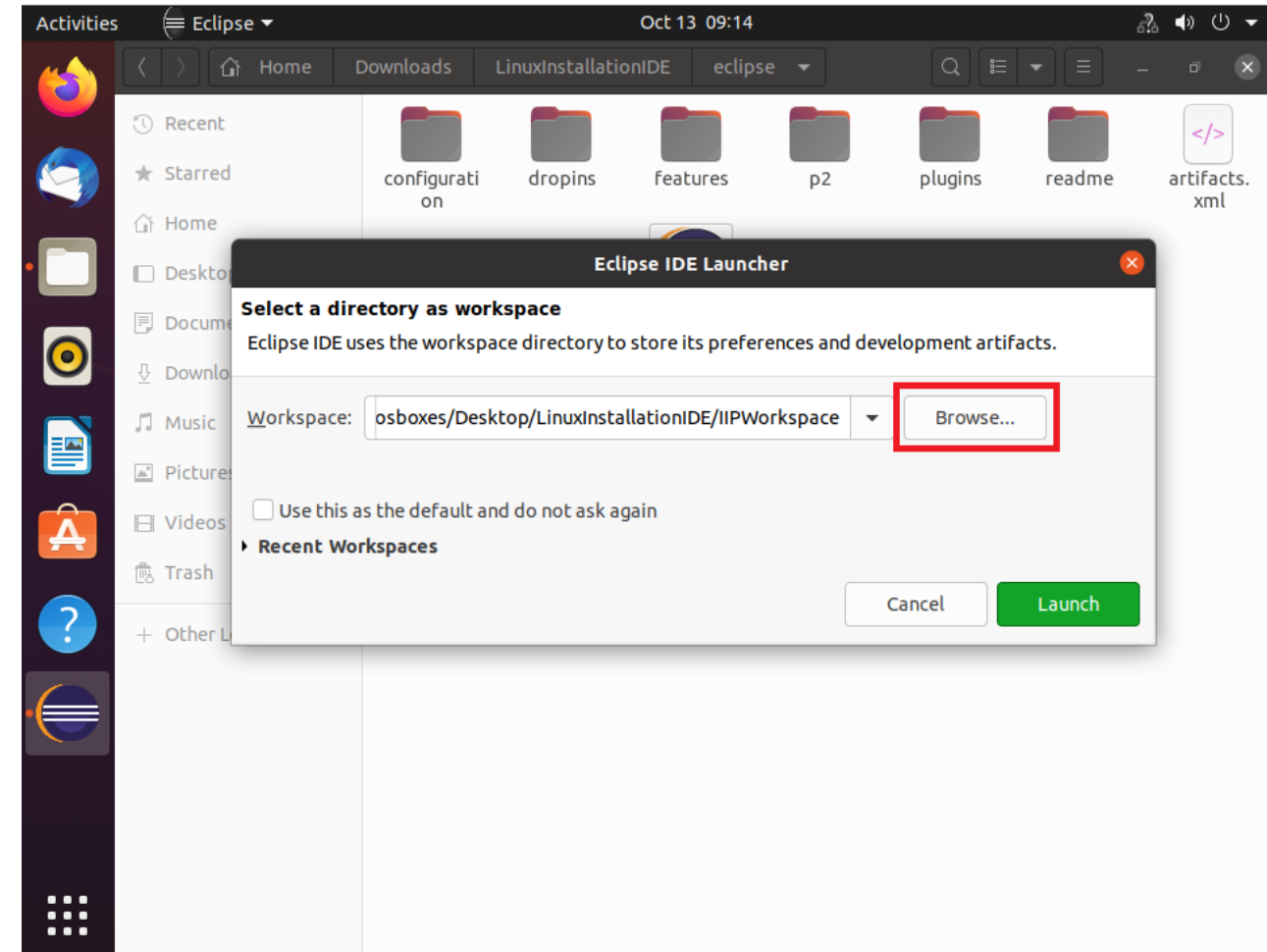
# Setup the IDE Eclipse environment

- Inside eclipse folder, open eclipse application.



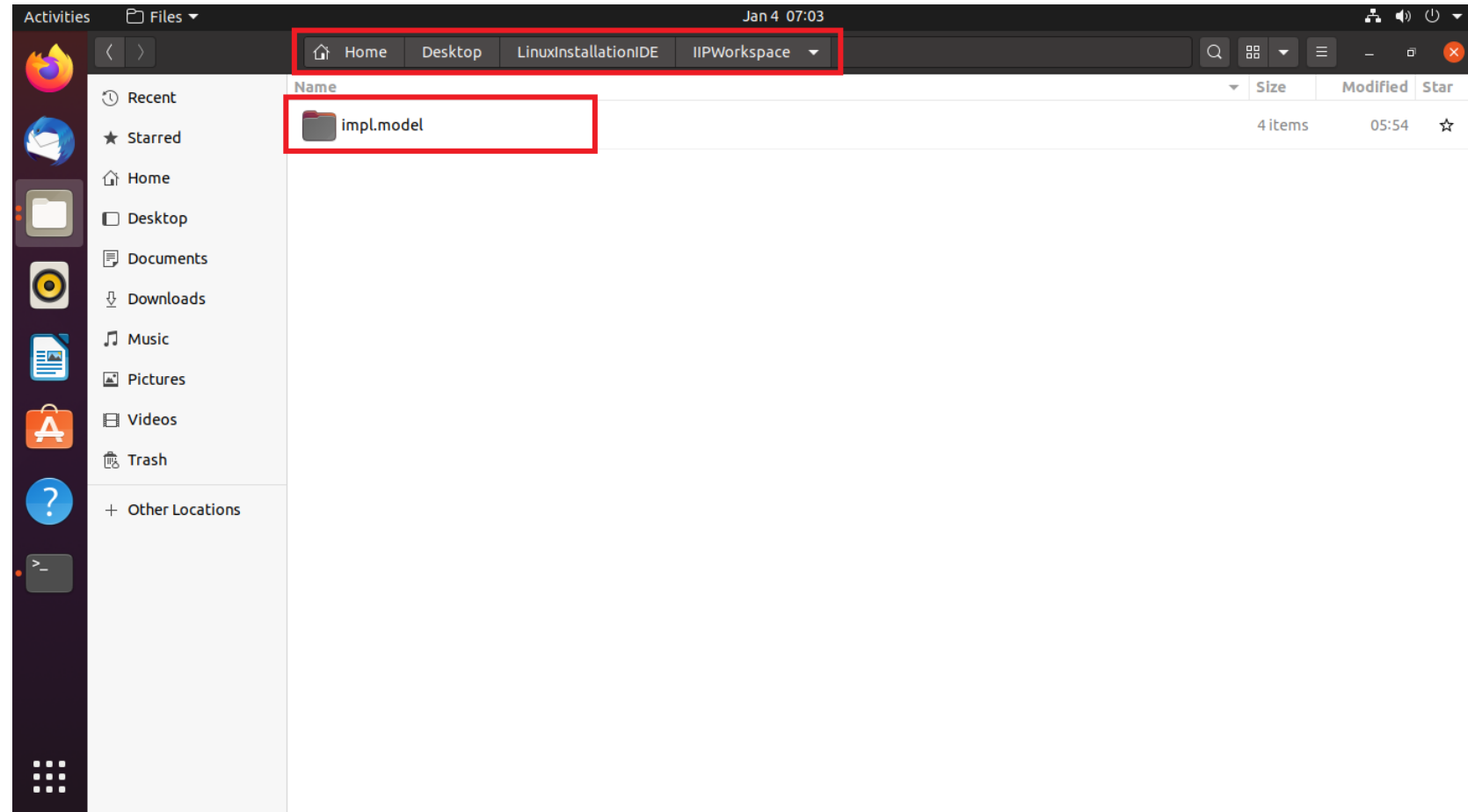
# Setup the IDE Eclipse environment

- Browse to IIPWorkspace in downloaded folder.



# Setup the IDE Eclipse environment

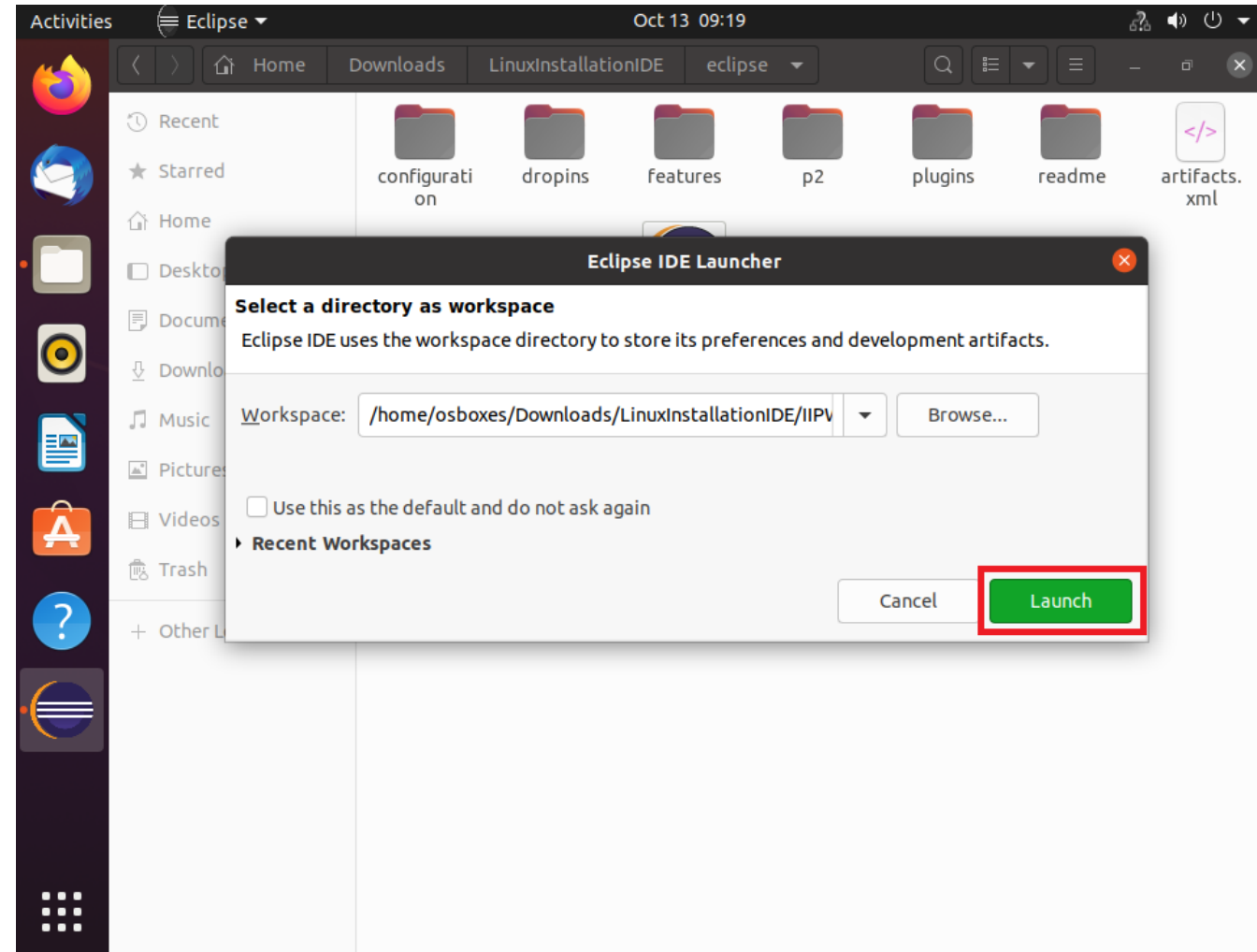
- You should see the following projects in that directory.
- Click open.





# Setup the IDE Eclipse environment

- Click Launch.

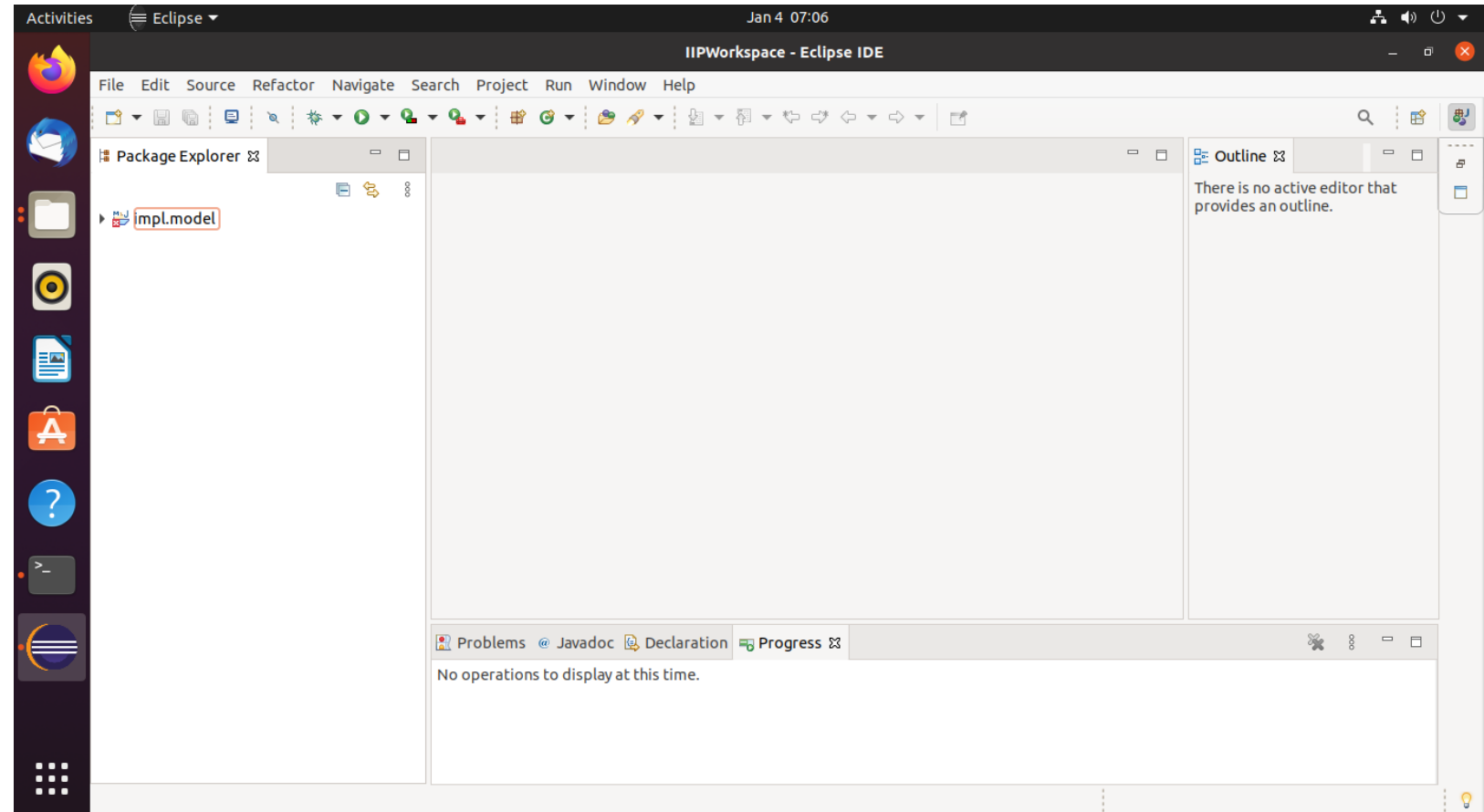




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# Setup the IDE Eclipse environment

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





# Install the platform

# Platform Installation - step (1)

- Create an empty folder and it (for example “Install”)
  - `mkdir Install`
  - `cd Install`
- Download Install-Package and unpack it
  - `wget https://jenkins-2.sse.uni-hildesheim.de/view/IIP-Ecosphere/job/IIP\_Install/lastSuccessfulBuild/artifact/install.tar.gz`
  - `tar xzpvf install.tar.gz`

# Platform Installation - step (2)

- Modify the IP address for the platform in the configuration file (src/main/easy/InstallTest.ivml) or use the following two commands to do so
  - `export localIP=$(hostname -I | cut -d ' ' -f1)`
  - `sed -i 's/147.172.178.145/'$localIP'/g' src/main/easy/InstallTest.ivml`
- Instantiate platform: Execute in “install folder”
  - `mvn install`
- Now the platform is installed, the script files are create and ready to start.



# Start The Platform

# Start The Platform

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

# Start The Platform Local - Step (1)

- The broker scripts and files in “Install/gen/broker” folder, run the following script in separate terminal to start it
  - `broker.sh`
- The platform scripts and files in “Install/gen” folder, run the following script separate terminal to start it
  - `platform.sh`



## Start The Platform Local - Step (2)

- To make the platform machine working as resources run the following scripts, each one in separate terminal
  - `ecs.sh`
  - `serviceMgr.sh`
- Or just run the following script in separate terminal (share the same memory)
  - `ecsServiceMgr.sh`
- To start the command line interface for the platform run the following script in separate terminal
  - `cli.sh`
- The above scripts are exists in “Install/gen” folder

# 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 should 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.sh`
  - `serviceMgr.sh`
- Or just run the following script in separate terminal (share the same memory)
  - `ecsServiceMgr.sh`
- If everything worked fine, then PC/Device should be listed as a platform resource.



# Add a Linux 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 26)** from the platform server to the Edge device and run it.
    - gen\ecs8.sh instead of gen\ecs.sh
    - gen\serviceMgr8.sh instead of gen\serviceMgr.sh
    - gen\ecsServiceMgr8.sh instead of gen\ ecsServiceMgr.sh



# Stop The Platform

# Stop The Platform

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



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# Kontakt



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