



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. 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)

- **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



Setup the IDE Eclipse environment



Setup the IDE Eclipse environment

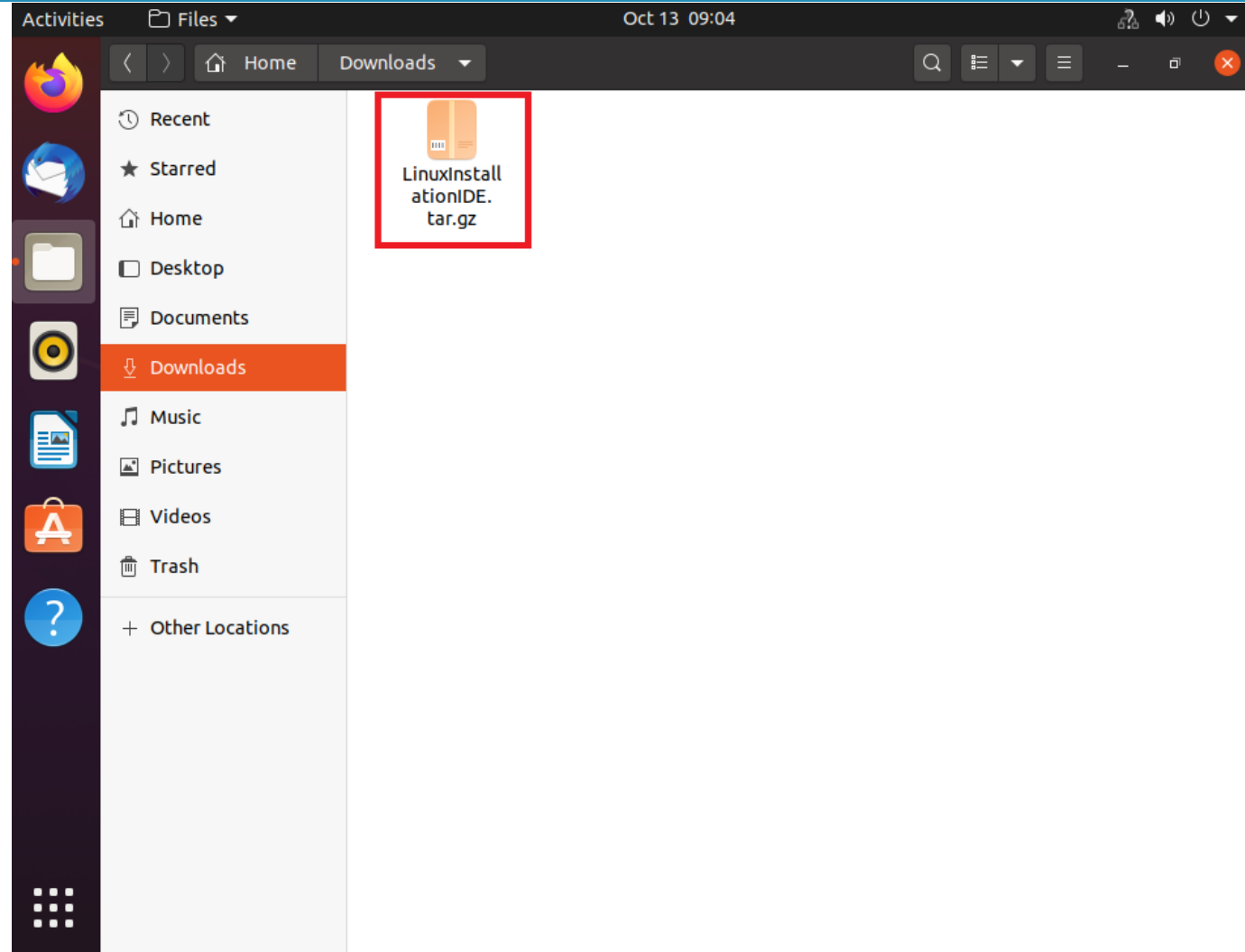
- For the purpose of the Service Workshop, we have prepared the projects and the examples for Eclipse IDE - with exact Eclipse version (**Eclipse 2021-03, version 4.19.0**) provided by the link in next slide.
- Any other Java-enabled IDE like Netbeans may do, but this requires manual work.
- The Eclipse 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/31bvVWPVC0q1Bzm>
- Extract the tar file.

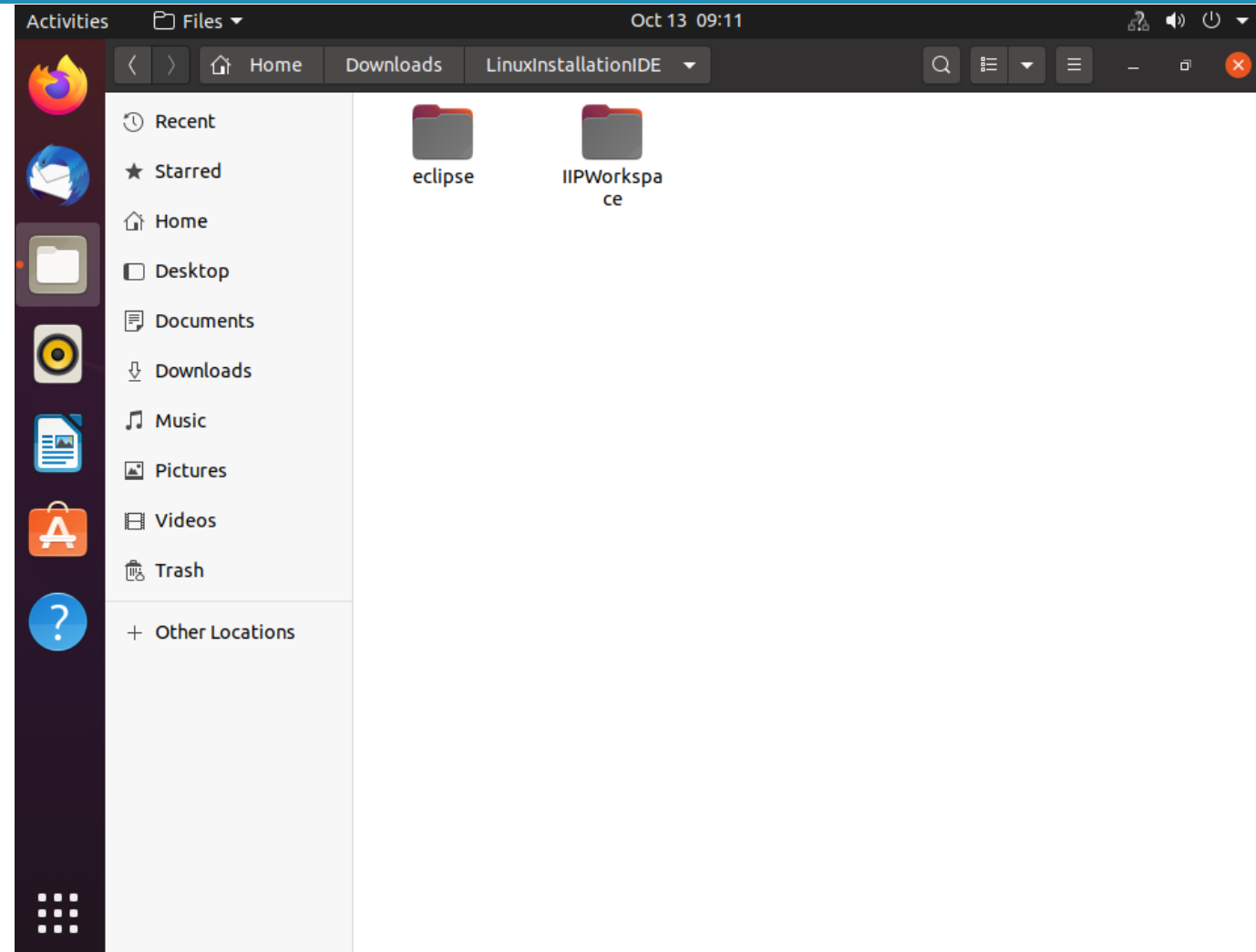




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Setup the IDE Eclipse environment

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

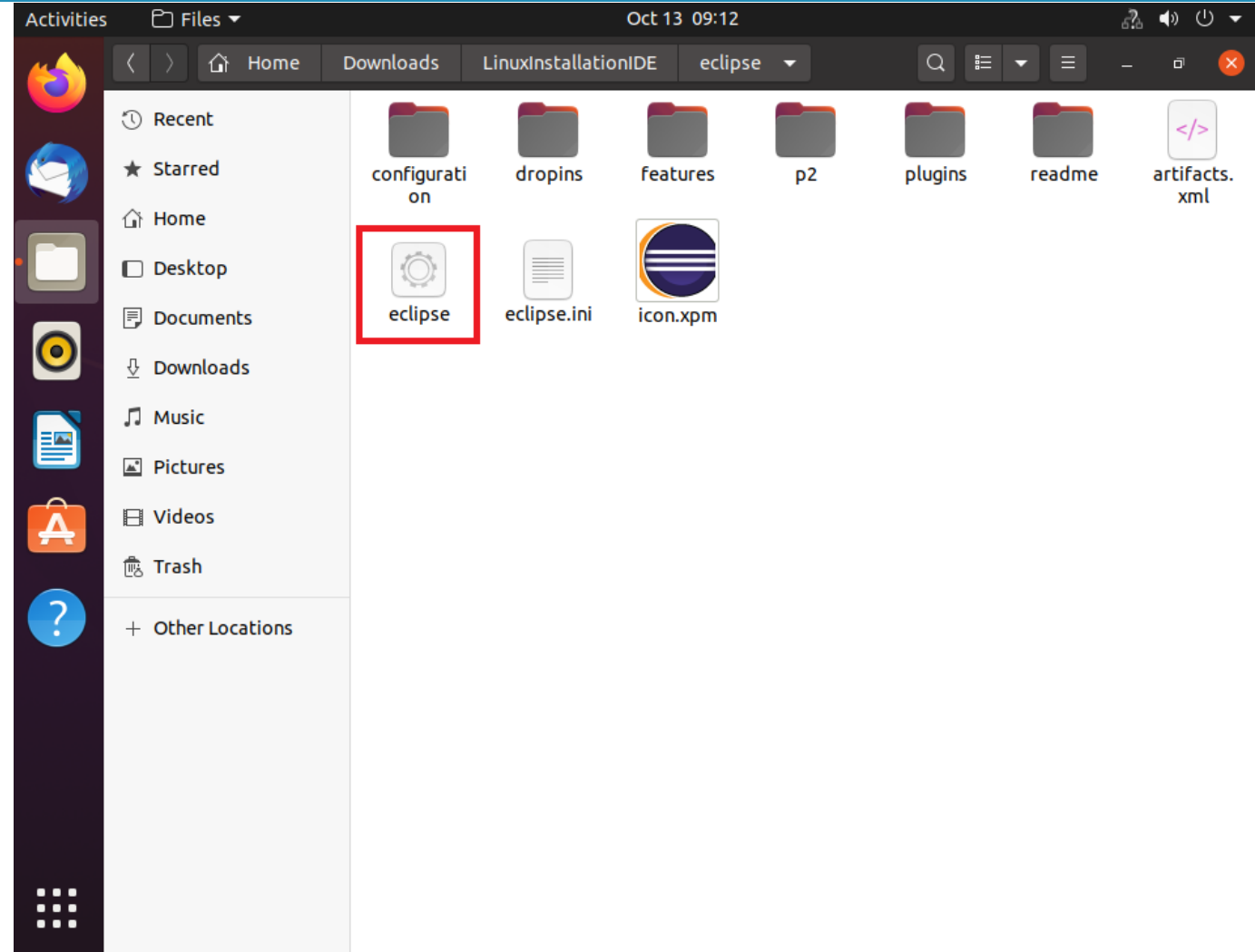




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Setup the IDE Eclipse environment

- Inside eclipse folder, open eclipse application.

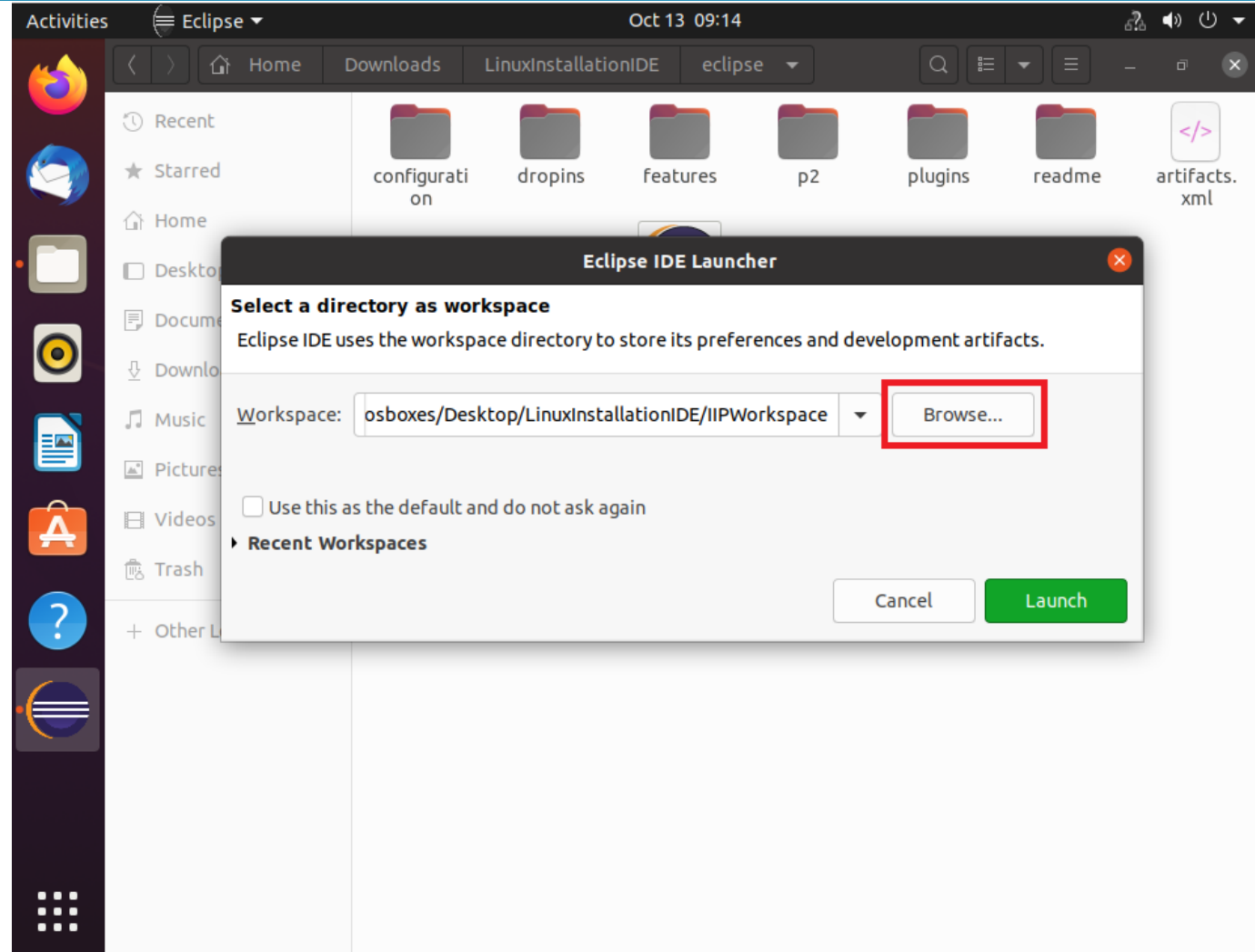




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Setup the IDE Eclipse environment

- Browse to IIPWorkspace in downloaded folder.

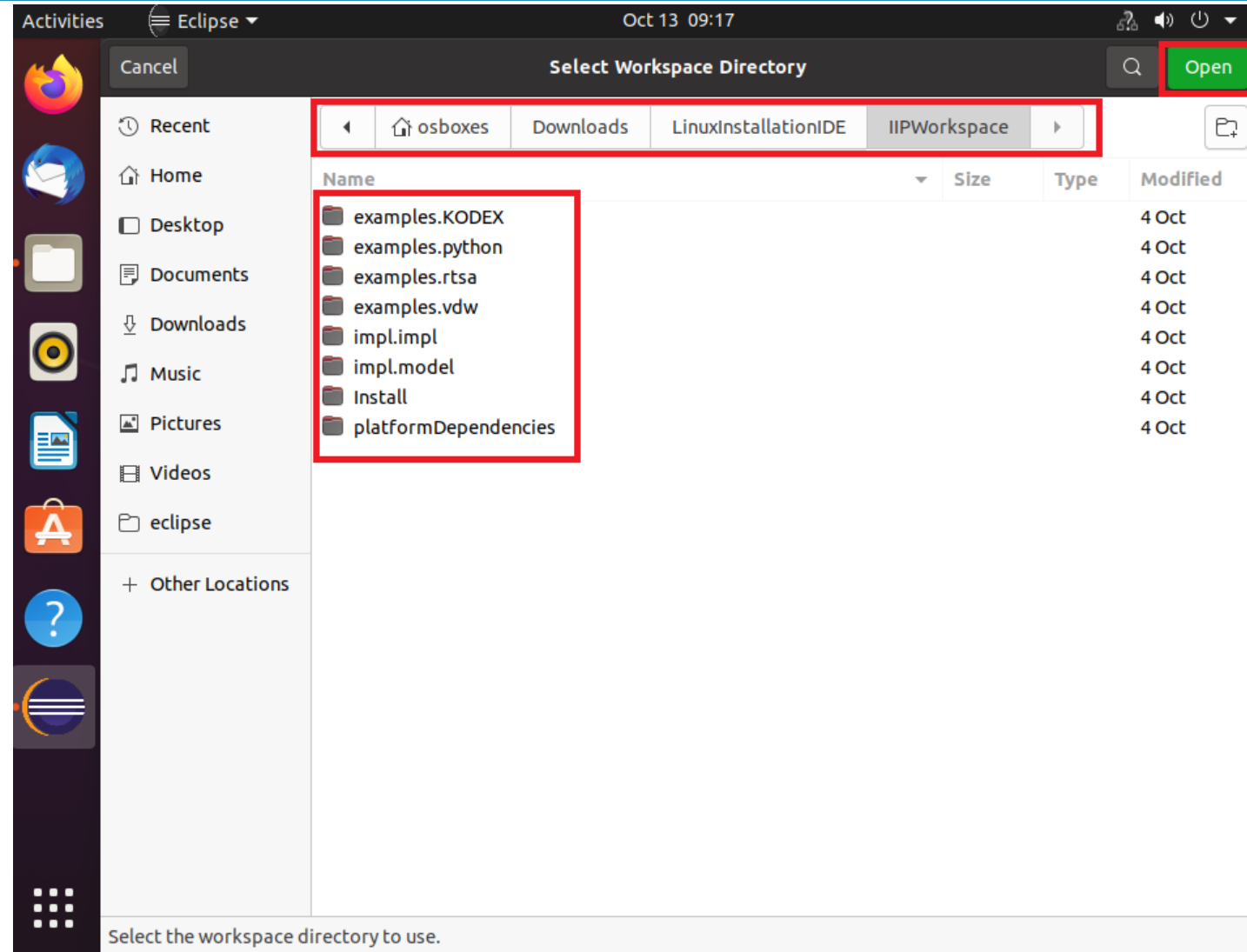




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Setup the IDE Eclipse environment

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

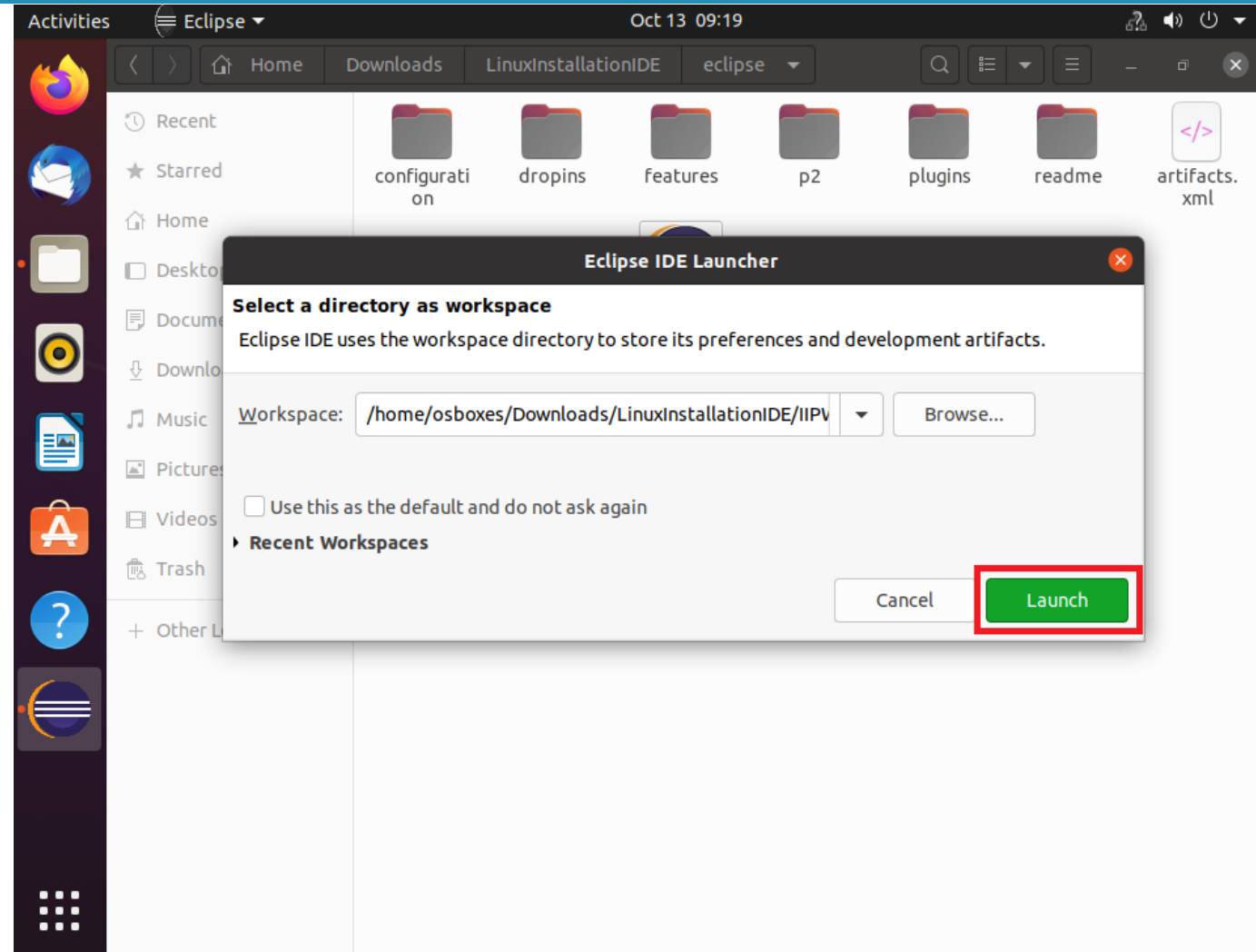




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Setup the IDE Eclipse environment

- Click Launch.

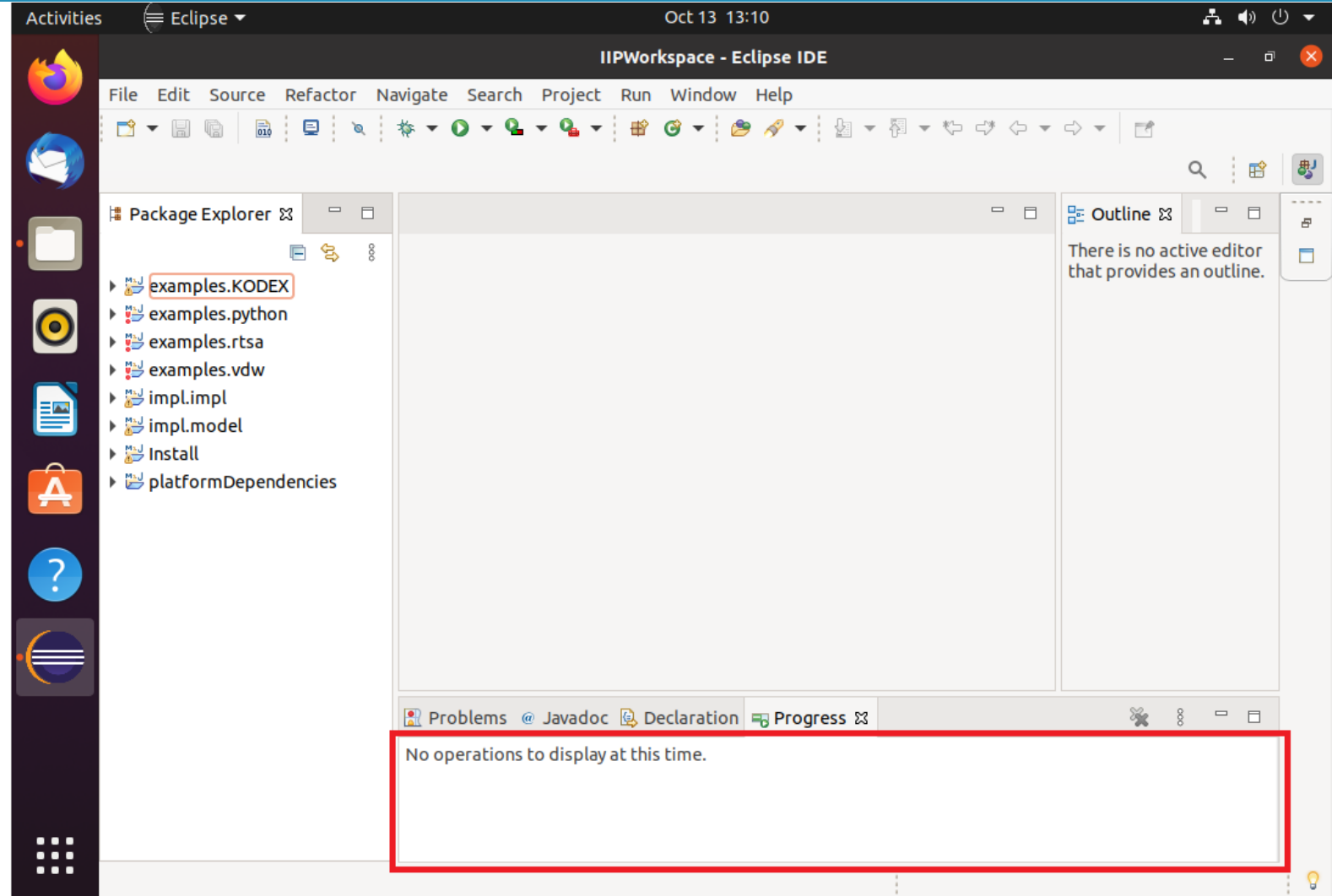




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Setup the IDE Eclipse environment

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





Install the platform



Docker Engine Installation - step (1)

- **Please note that you should install Docker Engine in case to want to run 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 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`



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)

- Install platform dependencies
 - `cd platformDependencies`
 - `mvn install`
 - `cd ..`
- Obtain platform bootstrap packages
 - `mvn package`

Platform Installation - step (3)

- 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 exec:java`
- 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)

- **Please note that you should execute all the steps in “Required setup (Prerequisites)” and the first 2 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 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 join the device as resources in the platform 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`
- 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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