Linux Platform Installation Guide

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IIP-Ecosphere Platform Documentation

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  1. Platform install using pre-defined Docker image
     a) Install Docker.
     b) Running the container.
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     d) Stop the IIP-Ecosphere platform.

Platform Handbook

- In the IIP-Ecosphere Platform Handbook (in the link below), you can find more detailed information about each of the steps in this guide.

https://www.iip-ecosphere.de/wp-content/uploads/2022/09/PlatformHandbook-final-V0.4.pdf

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- If **Docker Engine v20.10.7** is not installed, then Install **Docker Engine v20.10.7** by executing the following commands:

```
- sudo apt-get update -y
- sudo apt-get install \
    ca-certificates \
    curl \
    gnupg \
    lsb-release -y
```

- If **Docker Engine v20.10.7** is not installed, then Install **Docker Engine v20.10.7** by executing the following commands:
  - `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`

- If **Docker Engine v20.10.7** is not installed, then Install **Docker Engine v20.10.7** by executing the following commands:

  ```
  - 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
  ```

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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`

- Your screen should look like: (See next slide)

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: 'x11vnc' 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: x11vnc 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)
```

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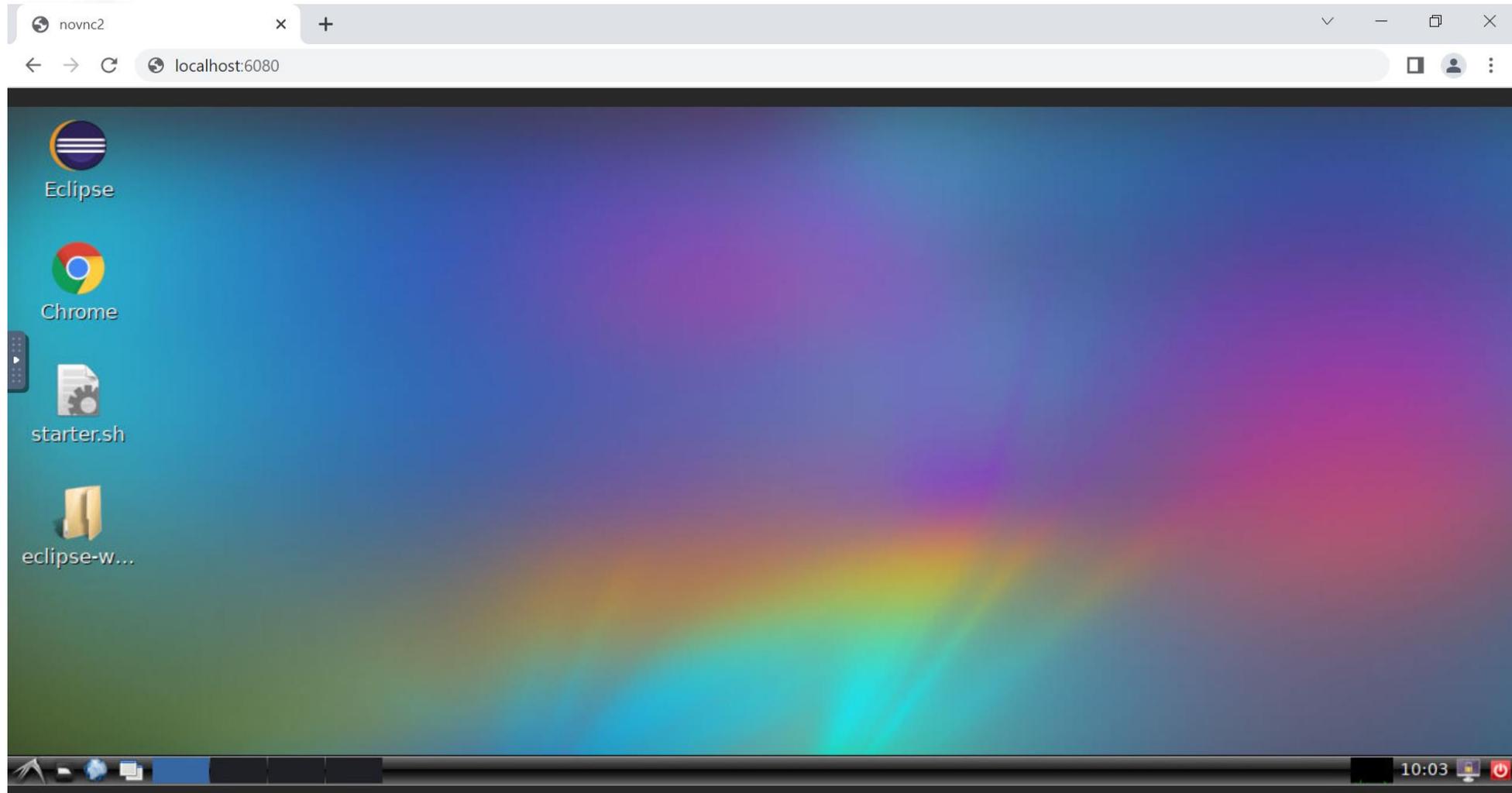
Development Environment

- 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 runs the container.

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

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

- Your screen should look like: (See next slide)

Development Environment

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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 may be 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 requires Java **JDK 11 or 13**, no other. In this guide we are installing **JDK 13**.

- If Java **JDK 13** is not yet installed on your machine, then install Java **JDK 13**

    - `sudo apt install openjdk-13-jdk-headless -y`

Required Setup - step (2)

- If **Maven 3.6.3** is not yet installed on your machine, then install **Maven 3.6.3**

  ```
  - wget https://archive.apache.org/dist/maven/maven-
  3/3.6.3/binaries/apache-maven-3.6.3-bin.tar.gz


  - tar xzpvf apache-maven-3.6.3-bin.tar.gz


  - export PATH=$PWD/apache-maven-3.6.3/bin:${PATH}
  ```

Required Setup - step (3)

- 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 you may need such as Angular, JavaScript… etc. Please check the platform handbook for more information.

Required Setup - step (4)

- 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`

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Platform Installation - step (1)

- Create an empty folder and name 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/ TechnicalSetup.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/TechnicalSetup.ivml
  ```

- Instantiate platform: Execute in "Install" folder

  ```
  -mvn install
  ```

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

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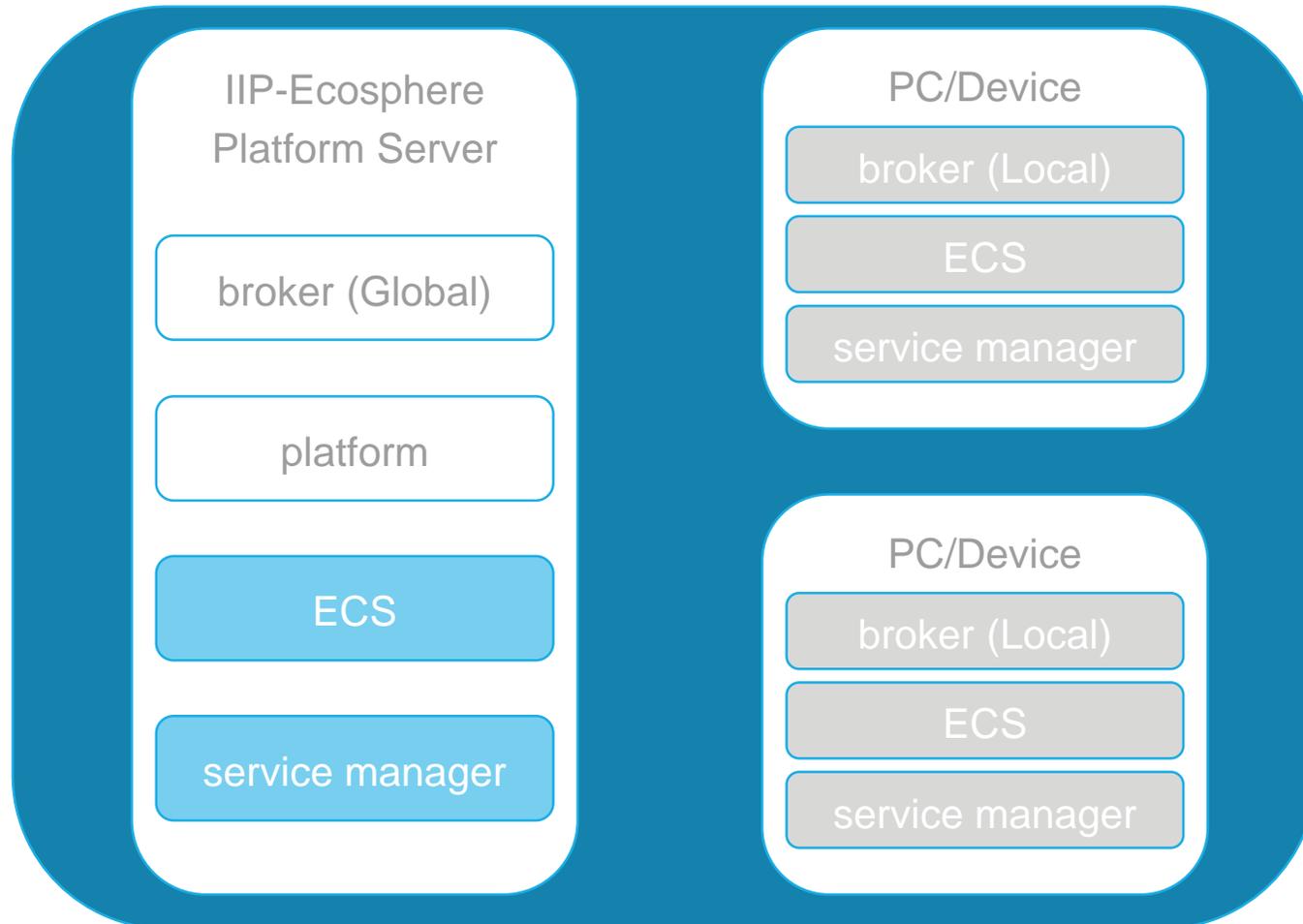   d) Stop the IIP-Ecosphere platform.

Start the Platform

- There are two possible always to the run the platform:

  - Local: One machine working as platform and device at the same time.

  - Distributed: One machine working as platform, another machine(s) working as device(s)

Platform in Big Picture

IIP-Ecosphere Platform Server

- broker (Global)
- platform
- ECS
- service manager

PC/Device

- broker (Local)
- ECS
- service manager

PC/Device

- broker (Local)
- ECS
- service manager

- White components are required to start the platform on a machine.
- In the case of Local: light blue components are required on a machine to work as a platform and device.
- In the case of Distributed: grey components are required for each new PC/Device that should be added as a resource in the platform.

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`

- 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\broker (folder)
  - gen\svcJars (folder)

  - gen\ecs.sh (file)
  - gen\serviceMgr.sh (file)

Start the Platform distributed - step (2)

- To add the new PC/Device as a resource in the platform run the following scripts on the new PC/Device, each one in separate terminal
  - `broker.sh` ("broker" folder)
  - `ecs.sh`
  - `serviceMgr.sh`

- If everything worked fine your newly added PC/Device should be listed as a platform resource.

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Stop the Platform

- Stopping the platform:

- Type Crtl-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

Contact

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