



Open Consortium for Decentralized Medical Artificial Intelligence

HORIZON-HLTH-2021-CARE-05-02

Deliverable D1.3

Manual on setting up SL onsite

Lead beneficiary	TUD
Author(s)	Oliver Saldanha
Dissemination level	PU
Type	DEC
Delivery date	21/09/2023

*ODELIA is funded by the European Union's Horizon Europe Framework
under Grant Agreement 101057091*



**Funded by
the European Union**

TABLE OF CONTENTS

Summary	3
PC Setup to Install UBUNTU on the Windows Operating System	3
Step-by-Step Installation Manual for Setting up the Swarm Learning Environment:	4
Setting up the User and Repository:.....	4
Setting up the Swarm Learning Environment	4
Automation System and Setup	5
Running Swarm Learning Nodes	5
Conclusion.....	6

DISCLAIMER

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

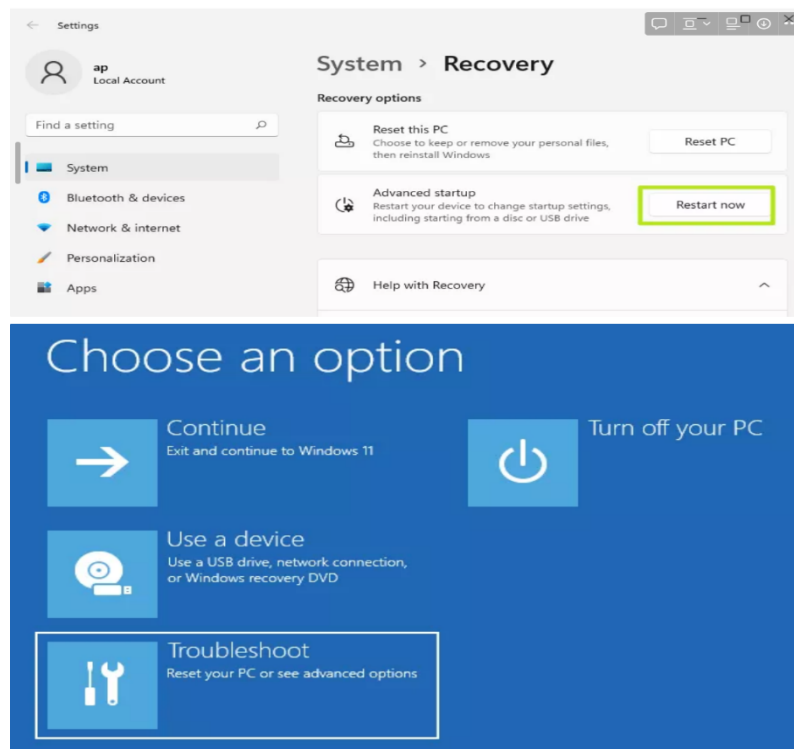
SUMMARY

This progress report outlines several significant achievements in the ODELIA D1.3 phase.

PC SETUP TO INSTALL UBUNTU ON THE WINDOWS OPERATING SYSTEM

Here are concise instructions for Windows system settings: To shrink a volume, open System and Security, navigate to Windows Tools, select Computer Management, go to the Disk Management section, locate the Windows (C:) drive, right-click on it, choose Shrink Volume, specify the desired size (e.g., 500,000 MB), and complete the process. To access Advanced Startup Settings, open Control Panel, navigate to the Advanced Startup section, or simply search for "advanced startup" in the Windows search bar and select the top result for convenience.

Click **Restart now** under the Advanced Startup header.



→ Use a device → select USB stick with UBUNTU operating system → Install the Operating system

Follow the next steps on the UBUNTU operating system

- Install visual studio code
- Install TeamViewer <https://www.teamviewer.com/de/download/linux/>
- Select nvidia driver via software updater → settings → Additional Drivers → nvidia 525 (proprietary)
- Test in terminal with `nvidia-smi`
- Insert in terminal: `apt install git`
- Follow steps on github:
- Install ssh with `sudo apt install openssh-client` and `sudo apt install openssh-server`

STEP-BY-STEP INSTALLATION MANUAL FOR SETTING UP THE SWARM LEARNING ENVIRONMENT:

Setting up the User and Repository:

- To begin, create a user in all the training systems and grant sudo privileges by adding them to the sudoers group. Afterward, log in as the user "swarm" and execute the following commands in the terminal.

Enter the following commands in the terminal.

```
$ sudo adduser swarm
$ sudo usermod -aG sudo swarm
$ sudo su - swarm
```

- Git repository setup: To set up the repository, create a directory with the same name on all training systems for consistency. Next, adjust the directory permissions as necessary. Using the chmod 777 command sets the permissions of a file or directory to the maximum possible level of openness. Specifically, it grants anyone to read, write, and execute the file or directory.

Enter the following commands in the terminal.

```
$ cd / && sudo mkdir opt/hpe && cd opt/hpe && sudo chmod 777 -R /opt/hpe
$ git clone https://github.com/KatherLab/swarm-learning-hpe.git && cd swarm-learning-hpe
```

- Install cuda environment and nvidia drivers, as soon as you can see correct outputs of the following command you may proceed. If the command returns correct outputs, it indicates that the CUDA environment and NVIDIA drivers are installed correctly, and you can proceed with further steps.

Enter the following commands in the terminal.

```
$ nvidia-smi
```

Note: Requirements and dependencies will be automatically installed by the script mentioned in the following section.

Setting up the Swarm Learning Environment

The environment variable for the command line interface should be modified according to the specific center and provided credentials for optimal functionality.

- <sentinel_ip> = 172.24.4.75 currently it's the IP assigned by VPN server for TUD host.
- <host_index> = Your institute's name. For ODELIA project should be chosen from TUD, Ribera, VHIO, Radboud, UKA, Utrecht Mitera Cambridge and Zurich.
- <workspace_name> = The name of the workspace you want to work on. You can find available modules under workspace/ folder. Each module corresponds to a radiology model. Currently, we suggest using odelia-breast-mri or marogoto_mri here. Then will be prompted to enter VPN credentials provided by TUD.

Note: Please replace the <placeholder> with the corresponding value in the CLI! The text is case-sensitive.

Automation System and Setup

To initiate automated swarm learning training, utilize the following command by pasting it into the terminal and substituting the placeholders with the appropriate values.

- Prerequisite: Runs scripts that check for required software and environment.

```
$ sh workspace/automate_scripts/automate.sh -a
```

- Server setup: Runs scripts that set up the swarm learning environment on a server.

```
$ sh workspace/automate_scripts/automate.sh -b -s <sentinel_ip> -d <host_index>
```

- Final setup: Runs scripts that finalize the setup of the swarm learning environment. Only <> is required. The [-n num_peers] number of partners used for training and [-e num_epochs] as the number of times the data has to be trained flags are optional

```
$ sh workspace/automate_scripts/automate.sh -c -w <workspace_name> -s <sentinel_ip> -d <host_index> [-n num_peers] [-e num_epochs]
```

Running Swarm Learning Nodes

To run a Swarm Network node -> Swarm SWOP Node -> Swarm SWCI node. Please open a terminal for each of the nodes to run. Observe the following commands:

- To run a Swarm Network (or sentinel) node:

```
$ ./workspace/automate_scripts/launch_sl/run_sn.sh -s <sentinel_ip_address> -d <host_index>
```

- To run a Swarm SWCI node(SWCI node is used to generate training task runners, could be initiated by any host, but currently we suggest only the sentinel host is allowed to initiate):

```
$ ./workspace/automate_scripts/launch_sl/run_swci.sh -w <workspace_name> -s <sentinel_ip_address> -d <host_index>
```

- To check the logs from training:

```
$ ./workspace/automate_scripts/launch_sl/check_latest_log.sh
```

- To stop the Swarm Learning nodes, --[node_type] is optional, if not specified, all the nodes will be stopped. Otherwise, could specify --sn, --swop for example.

```
$ ./workspace/swarm_learning_scripts/stop-swarm --[node_type]
```

- To view result tables, saved models and training logs see logs under workspace/<workspace_name>/user/data-and-scratch/scratch

CONCLUSION

This document is a manual for setting up Swarm Learning (SL) Onsite, offering instructions and details for establishing a local Swarm Learning environment.