SpdRoot Docker installation

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SpdRoot Workshop

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What is Docker?

- A “lightweight virtual machine”
- Packages your software + dependencies into a single image
- Runs identically on any system: your laptop, a cluster, or the cloud.

For Docker installation, please refer to the official documentation:
https://docs.docker.com/engine/install/ *(example for Ubuntu in backup slides)*

SpdRoot in Docker

The most recent official version of SpdRoot available in Docker is 4.1.6,
hosted on Docker Hub under: **jemtchou/spdroot:4.1.6**

For official installation instructions and usage guidelines, refer to:
https://git.jinr.ru/nica/spdroot/-/wikis/SpdRoot%20in%20Docker

The SpdRoot automated build pipeline is currently under development. As a temporary solution, you need to update the container manually to get the latest version.

Usage guideline

```
docker run \
--name spdroot \                                          Assign a name to the container
-v /tmp/.X11-unix:/tmp/.X11-unix -e DISPLAY=unix$DISPLAY \      If you need graphics
-it  \                                                    Run containers with interactive terminal access
jemtchou/spdroot:4.1.6 \                                  docker image
/bin/bash                                                 shell
```

Usage guideline

Show all containers (including stopped)
docker ps -a

List images
docker images

Start the container by: (for example, after reboot of your local machine)
docker start *spdroot*

Enter the container by:
docker exec –it *spdroot* /bin/bash

Inside SpdRoot container

Set up the environment by running

source /cvmfs/nica.jinr.ru/spd/centos7/spdroot/4.1.6/bin/SetEnv.sh

Run your script :

/cvmfs/nica.jinr.ru/spd/centos7/spdroot/4.1.6/bin/spdroot.py macros.C

Update to latest development version

cd /root/spdroot
git pull
git checkout development
cd build
make
make install

Exchange files

1) Bind Mount

```
docker run \
--name spdroot \
-v /tmp/.X11-unix:/tmp/.X11-unix -e DISPLAY=unix$DISPLAY \
-v ${Directory in you laptop}:${Directory container} \
-it  \
jemtchou/spdroot:4.1.6 \
/bin/bash
```

Assign a name to the container

If you need graphics

used to simplify transfer of files

docker image

Run containers with interactive terminal access

shell

2) from host to docker:

docker cp hostpath/source_file container_id:/dockerpath/target_file

from docker to host:

docker cp container_id:/dockerpath/source_file hostpath/target_file

VScode to develop SpdRoot

You may use **VSCode** *(https://code.visualstudio.com/)* to develop SpdRoot inside the container

Suggested steps:

- in VSCode install "Dev Containers" extension (and suggested extensions for development with C++ at later steps),
- start the container,
- open VSCode, press Ctrl+Shift+P and choose "Attach to running container",
- open the SpdRoot source folder.

Backup slides

Docker installation in Ubuntu

```
# Add Docker's official GPG key:
sudo apt-get update
sudo apt-get install ca-certificates curl
sudo install -m 0755 -d /etc/apt/keyrings
sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o /etc/apt/keyrings/docker.asc
sudo chmod a+r /etc/apt/keyrings/docker.asc

# Add the repository to Apt sources:
echo \
  "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.asc]
https://download.docker.com/linux/ubuntu \
  $(. /etc/os-release && echo "${UBUNTU_CODENAME:-$VERSION_CODENAME}") stable" | \
  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
sudo apt-get update
sudo apt-get install docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin
sudo usermod -aG docker ${USER}
su - ${USER}
```