**Abstract**

Docker is a recent technology which offers multi-infrastructure environment. Based on Linux containers, the Docker solution provides an ecosystem and a Hub for sharing images. Containers run lighter and quicker than virtual machines (VMs) but they are complementary technologies: on the IaaS (Infrastructure-as-a-Service) cloud infrastructure, the Docker plugging is not always integrated and on non Linux machines, the Docker daemon run inside a light VM. For space missions, scientists and engineers need a flexible environment in order to develop and run pipelines in production. Docker allows to develop the code locally, push it on a registry and run it on the scalable cloud in a multi-infrastructure approach. Furthermore, in the case of load peaks of the data analysis, the complex workflow can be managed by a hybrid cluster/cloud infrastructure including a Docker orchestrator.

**Docker history**

The Docker solution has been developed since 2013. The Docker technology is based on LXC (Linux Containers) and allows the isolation of processes. In the DevOps approach, each application is isolated within its specific environment and shared with other users.

**LISA DPC**

- The ESA L3 LISA space mission has the goal to study gravitational waves.

- The proto-Data Processing Center (DPC) for LISA [4] aimed to:
  - efficiently manage computing.
  - offer a development infrastructure.

**Image creation process**

- Docker Hub: a marketplace for sharing images of various OS and applications.
- Dockerfile: a kind of shell script with specific instructions (RUN ...).
- Compose file: a YAML file allowing to automate the building of a multi-container application.

**Public registry**

- Image sharing: Docker Hub, a SaaS platform (cloud hosted service).
- Automatic image build:
  - Version control repository: GitHub or Bitbucket hosting Dockerfile and Readme.
  - Image build on new commit.
  - Branches on-demand (latest / develop).

**Private registry**

- Image sharing: Registry, a containerized service for secure image sharing (non public code, restricted users).
- Manual image creation.
- SaaS service:
  - Simple Web server (without Web interface) created with Compose Registry and Nginx containers.
  - Security: TLS certificates.
  - Domain name: myregistrydomain.com associated with IP address.

**References**

3. Poncet et al., Private and cloud based clusters, BiDS’16 (2016).