DREAM
Distributed Resources
for the Earth System Grid Federation (ESGF) Advanced Management

JPL Task Plan No. 82-19888
September 2017 Quarterly Report

This report covers the last quarter of FY-2017 (July-September 2017). During this period, JPL staff, in accordance with the Task Plan mutually agreed upon with LLNL, performed the following activities:

- **Release of version 1.2 of ESGF/Docker architecture**. This version makes use of the new "docker-stack" functionality to enable deployment of ESGF services on a distributed system of nodes managed as a Docker Swarm. The architecture is depicted in Figure 1, and was tested both on a MacOSX laptop (using docker-machine to create multiple local VMs), and on the Amazon Cloud. A demo was presented at the August 2017 ESGF developers conference call.
- **Packaging of SLCS server as Docker container**. The SLCS ("Short Lived Certificate Server") developed by CEDA was re-packaged as a Docker image, converting the original setup from an Ansible script to a Docker file. Testing was performed using both the included web client interface, and the external online CA python client. This image was included in the 1.2 release mentioned earlier.
- **Collaborated with University of Utah to include Visus server**. The JPL team held several conference calls with the University of Utah to the goal of eventually packaging and including the Visus streaming visualization server as a service component of the ESGF/Docker architecture. In the last call, Utah staff demoed a fully functional Docker container, and JPL provided requirements for ingestion of NetCDF data files, and on-demand conversion of existing ESGF data archives, which will be the focus of development in the next quarter.
- **Established ESGF-Container Working Group**. We established a new ESGF working group to collaborate with other U.S. and European institutions to develop and deploy ESGF services as Docker containers. The group will be co-led by Luca Cinquini (JPL) and Sebastien Gardoll (IPSL).
- **ESGF 2.5.13 Release**. JPL staff provided support for the long-awaited ESGF 2.5.13 release, including several functionality improvements and bug fixes for the following modules:
  - ESGF Search
  - ESGF User Interface (CoG)
  - ESGF Security
- **ESGF Executive Committee and Working Groups**. JPL staff attended several ESGF conference calls for executing management and working groups.
- **ESGF Nodes Operations**. JPL staff continued operations and upgrades of the ESGF nodes at JPL, NOAA, CU.
- **ESGF-NASA DAACs interoperability study**. JPL staff participated in a joint ESGF-NASA study about providing an interoperability layer between some data

collections hosted at NASA DAACs, and ESGF. In the next months, the study will culminate in a prototype that will published a few NASA data records to the ESGF global search service.

ESGF-NG v1.2 w/ Docker Stack

esgf_type=front_node
esgf-httpd
Apache httpd
CoG (mod_wsgi)
COG DATA

esgf_type=index_node
esgf-index-node
esgf-search webapp (Tomcat)

esgf_type=solr_node
esgf-solr
Solr (Jetty)
SOLR DATA

esgf_type=db_node
esgf-postgres
Postgres
POSTGRES DATA

esgf_type=data_node
esgf-data-node
thredds webapp (Tomcat)
esgf-orp (Tomcat)
esgf-stats (Tomcat)
esgf-publisher (Python)
TDS CATALOGS
DATA ARCHIVE

esgf_type=idp_node
esgf-idp-node
esgf-idp (Tomcat)
esgf-slsc
esgf-slcs (django app)
slcs-nginx
Nginx
slcs-postgres
Postgres

esgf_type=compute_node
esgf-visus-server
Visus

ESGF application
Docker container
Swam Node
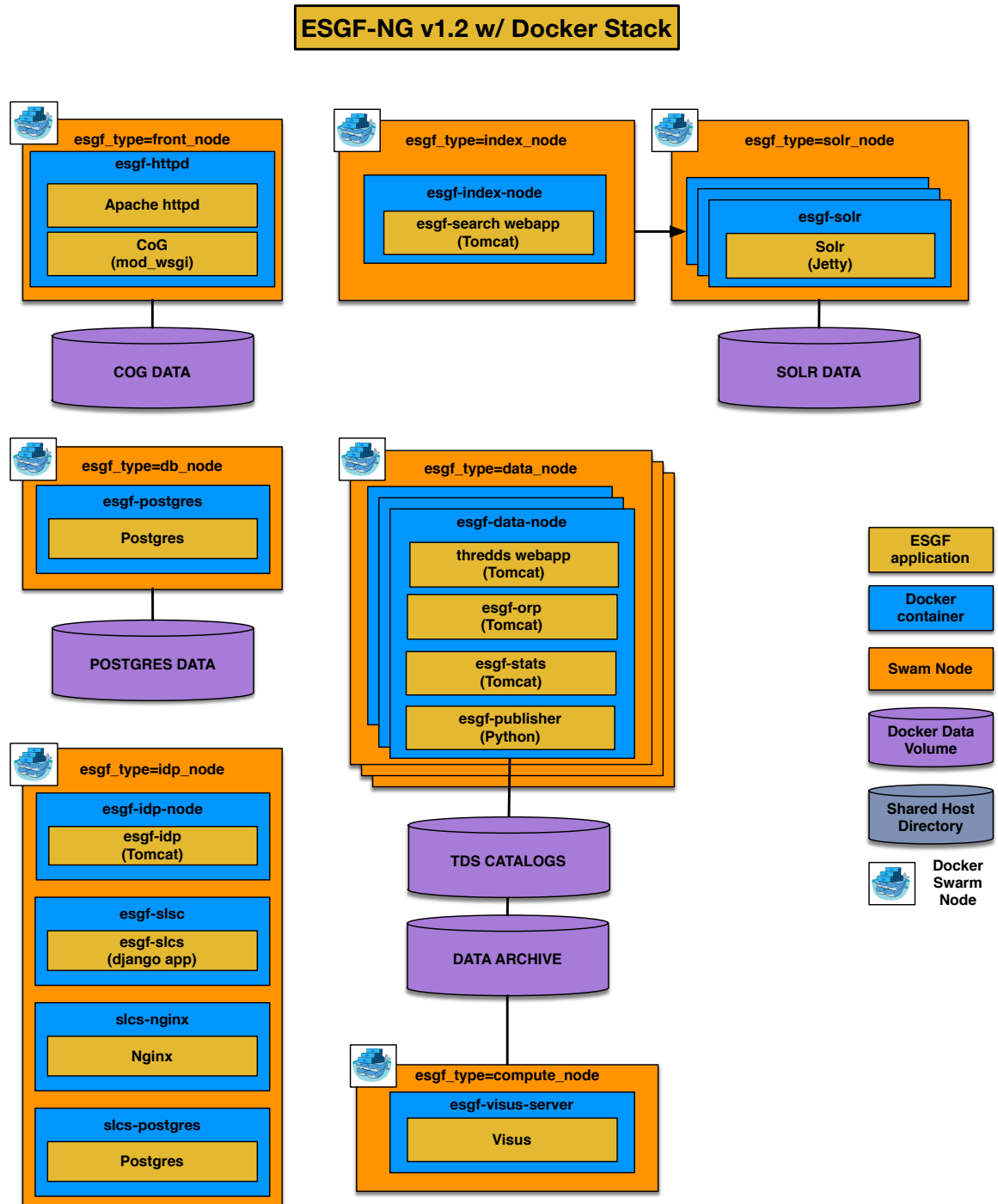Docker Data Volume
Shared Host Directory
Docker Swarm Node

Figure 1: block diagram of the ESGF/Docker architecture version 1.2