

Cloud Environment Automation: from infrastructure deployment to application monitoring

Wednesday, October 12, 2016 11:45 AM (15 minutes)

Open City Platform (OCP) is an industrial research project funded by the Italian Ministry of University and Research, started in 2014. It intends to research, develop and test new technological solutions open, interoperable and usable on-demand in the field of Cloud Computing, along with new sustainable organizational models for the public administration, to innovate, with scientific results, with new standards and technological solutions, the provision of services by the Local Public Administration (PAL) and Regional to citizens, businesses and other public administrations.

After the development and integration of the different components of the OCP platform that includes IaaS, PaaS and SaaS services, we had to cope with an increasing number of requests to deploy new testbeds at the PALs interested to deploy the OCP platform starting from the IaaS/OpenStack level. In this contribution we present the OCP solution for the automatization and standardization of installation and configuration procedures. With respect to already existing similar tools like Fuel or Staypuft, that were also tested, the solution adopted allows a very flexible initial customization of the services so that it can easily adapt to the different hardware resources and even virtualization techniques that the experimenting PALs make available.

The solution proposed is leveraging two of the most popular open source automation tools, namely Foreman and Puppet, making use as much as possible of the official OpenStack Puppet modules, as well as of other community supported Puppet modules for services like MySQL/Percona, CEPH. We concentrated on the integration of these modules by developing a new Puppet module, `iaas-ha`, based on different roles (like controller, compute, storage, monitoring nodes) and profiles (like nova, neutron, zabbix, etc), and making it configurable through the Foreman interface. With our solution we tried to address the different requirements and realities that we met during the collaboration with PAs, including, among others: the configuration of multiple external networks; full management of the configuration of the network layer giving the ability to merge or split the configuration of the various OpenStack networks (management, data, public and external); use of CEPH both as block and object storage backend - configuring the RADOSGW to use CEPH RADOS library in order to expose Swift APIs; fine grained variable configuration through the use of the Foreman GUI allowing site-admins to specify the values of all service specific parameters.

We will also present the first outcome of the work done in order to integrate the Cloud Formation as a Service in our automation tool for the installation and configuration of the OCP PaaS layer. Finally, we will discuss planned future work on the integration of a monitoring information service able to collect information about resource availability in different infrastructures for IaaS, PaaS and SaaS components.

Tertiary Keyword (Optional)

Experience/plans from outside experimental HEP/NP

Secondary Keyword (Optional)

Virtualization

Primary Keyword (Mandatory)

Cloud technologies

Primary authors: COSTANTINI, Alessandro (INFN CNAF); AIFTIMIEL, Doina Cristina (INFN - CNAF, IFIN-HH)

Co-authors: ITALIANO, Alessandro Italiano (INFN Bari); SALOMONI, Davide (INFN CNAF); MICHELOTTO, Diego (INFN - CNAF); ZIZZI, Giovanni (INFN CNAF); SALETTA, Marco (INFN Torino); VISTOLI, Maria (INFN

CNAF); PANELLA, Matteo (INFN CNAF); PERGOLESI, Matteo (INFN Perugia); BUCCHI, Riccardo (INFN CNAF); TRALDI, Sergio (INFN Padova)

Presenter: MICHELOTTO, Diego (INFN - CNAF)

Session Classification: Track 6: Infrastructures

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