Authors
Maitena Ilardia, TECNALIA
Galia Novakova, POLIMI

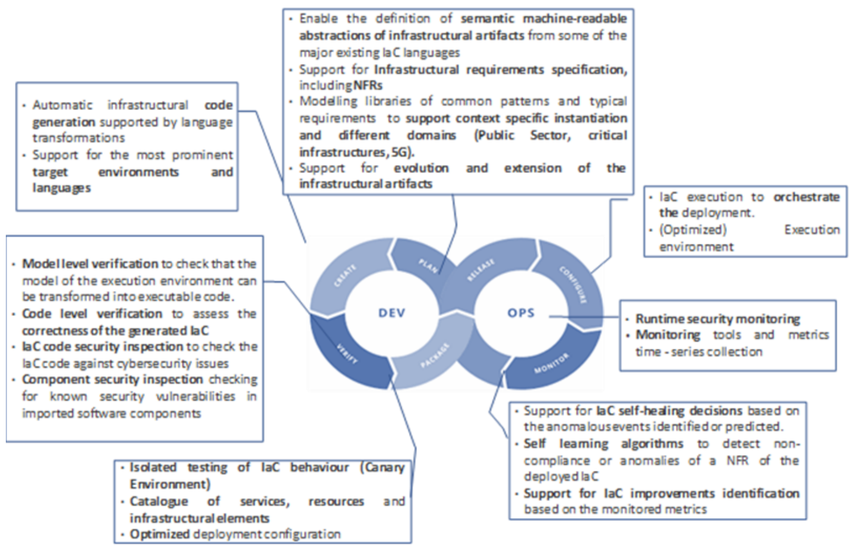
Enhancing the generation of Infrastructure as Code through DevOps Modelling Language (DOML)

Introduction

Infrastructure-as-Code (IaC) enables the automation of several deployments, configurations and management tasks that otherwise would have to be performed manually by an operator. IaC has a lot of potential in a cloud computing context as it results in a significant saving of time when an application needs to be redeployed on a different set of resources or needs to be extended with new components, even possibly running on different cloud infrastructures. In these cases, in fact, the infrastructural code can be reused, adapted, if needed, and then run for recreating very quickly the new or extended software instance.

PIACERE DevSecOps approach and framework

To achieve the IaC DevSecOps concept, PIACERE will provide an integrated DevSecOps framework to develop, verify, release, configure, provision, and monitor infrastructure as code. The extensible architecture and modular approach of PIACERE will support the different DevSecOps activities. Using a single integrated environment to develop (IDE) infrastructural code will unify the automation of the main DevSecOps activities and will shorten the learning curve for new DevSecOps teams. PIACERE will allow DevSecOps teams to model different infrastructure environments, by means of abstractions, through a novel DevOps Modelling Language (DOML), thus hiding the specificities and technicalities of the current solutions and increasing the productivity of these teams. Moreover, PIACERE will also provide an extensible Infrastructural Code Generator (ICG), translating DOML into source files for different existing IaC tools, to reduce the time needed for creating infrastructural code for complex applications.



Results

PIACERE will develop a solution covering the IaC lifecycle that will aid DevSecOps teams in:

1) enhancing their IaC development, verification, optimization, configuration, orchestration and operation processes,
2) improving developers' and operators' productivity by shortening their learning curve,
3) while ensuring the IaC correctness and Quality of Service (QoS) against violations in its whole life, facilitating reconfigurations and predicting problems,
4) as well as decreasing the time-to-market.

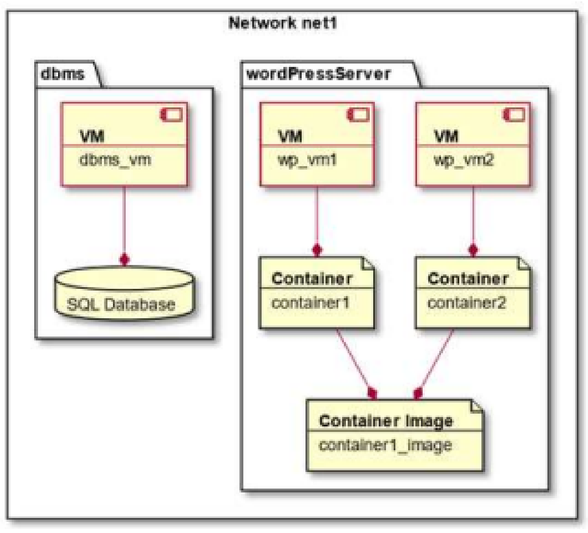


Figure 1. First DOML example in PIACERE project illustrates how realistic applications and their supporting infrastructure can be specified

Conclusions

The novel concept of the PIACERE DevSecOps framework to develop and operate IaC can address current challenges and increase the quality, security,trustworthiness and evolvability of the infrastructural code. The first proof of concepts (PoC) of the solution have been released in the end of 2021. These initial versions of the components will be validated in thePIACERE pilots in three different business domains (i.e. Public Administrations, Critical Maritime Infrastructures and Public Safety on IoT in 5G) and willbe then reviewed and enhanced in the following releases

Contact
Maitena Ilardia
Communication manager

Tel.: +34 664 103 325
maitena.ilardia@tecnalia.com
www.tecnalia.com