PIACERE - DevSecOps Automated

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7bulls.com - Research & Development Center

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CRÉDIT IMPÔT RECHERCHE CIR AGRÉMENT 2018-2020

CENTRUM BADAWCZO ROZWOJOWE

7bulls has been certified as a research and development center on the Polish and French market (CBR and CIR respectively). Examples of innovative projects implemented by 7bulls can be found at 7bulls.com/rnd

DevSecOps

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DevSecOps is **the integration of security into emerging agile IT and DevOps development as seamlessly and as transparently as possible.** Ideally, this is done without reducing the agility or speed of developers or requiring them to leave their development toolchain environment.

Source: Gartner IT Glossary: https://www.gartner.com/en/information-technology/glossary/devsecops

But why do we need Sec in DevOps?

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- We hope nobody denies security is of utmost importance these days, but we argue it's even more important for Software-Defined Infrastructure as it happens in DevOps.
- Frequent build and deploy process is especially vulnerable to misconfiguration and security leaks.
- Heterogeneity of infrastructure additionally increases the risks.

Introducing PIACERE (PLEASURE)

Programming trustworthy **I**nfrastructure **A**s **C**ode in a s**E**cu**RE** framework

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1. Horizon 2020 project in Software Development call.
2. Consortium consists of 12 organizations (academia, business, government) and is led by Tecnalia from Spain.
3. Schedule - 01.12.2020 - 30.11.2023
4. 7bulls.com is responsible for integration and Canary Sandbox Environment.

PIACERE DevSecOps - goals

PIACERE

- Develop, build and deploy applications
- Manage cloud, hybrid and multicloud deployments
- Maintain and configure the infrastructure
- Optimize usage of resources
- Test deployments and infrastructure
- Avoid snowflakes (and related config drifts)

Including agile approach and security rules and principles.
Fast, reliable and secure deployments out-of-the-box!

PIACERE DevSecOps - key features

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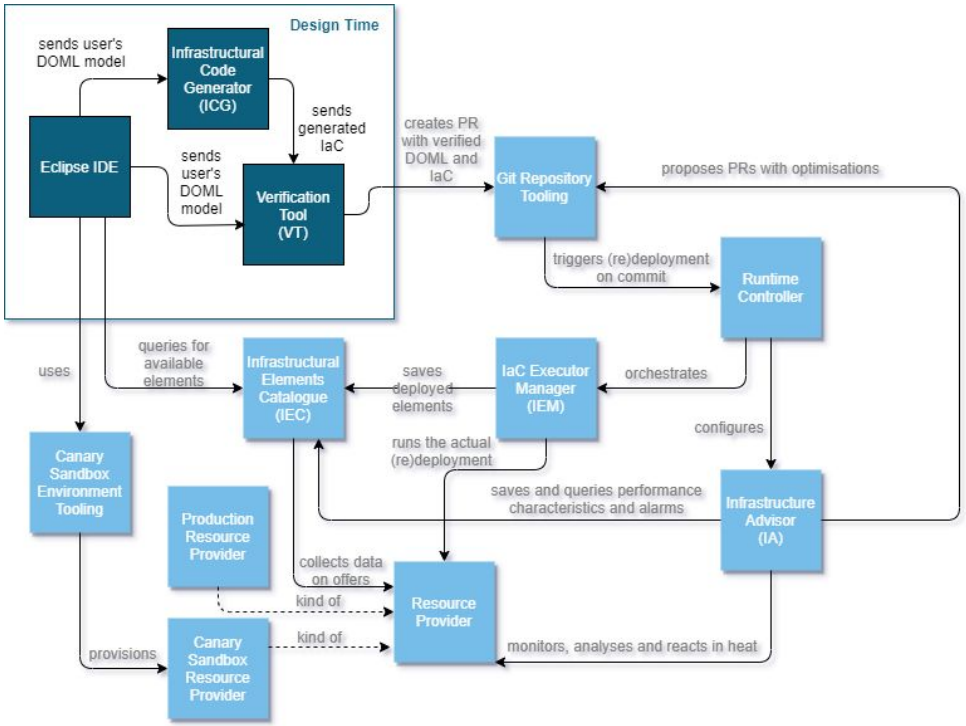
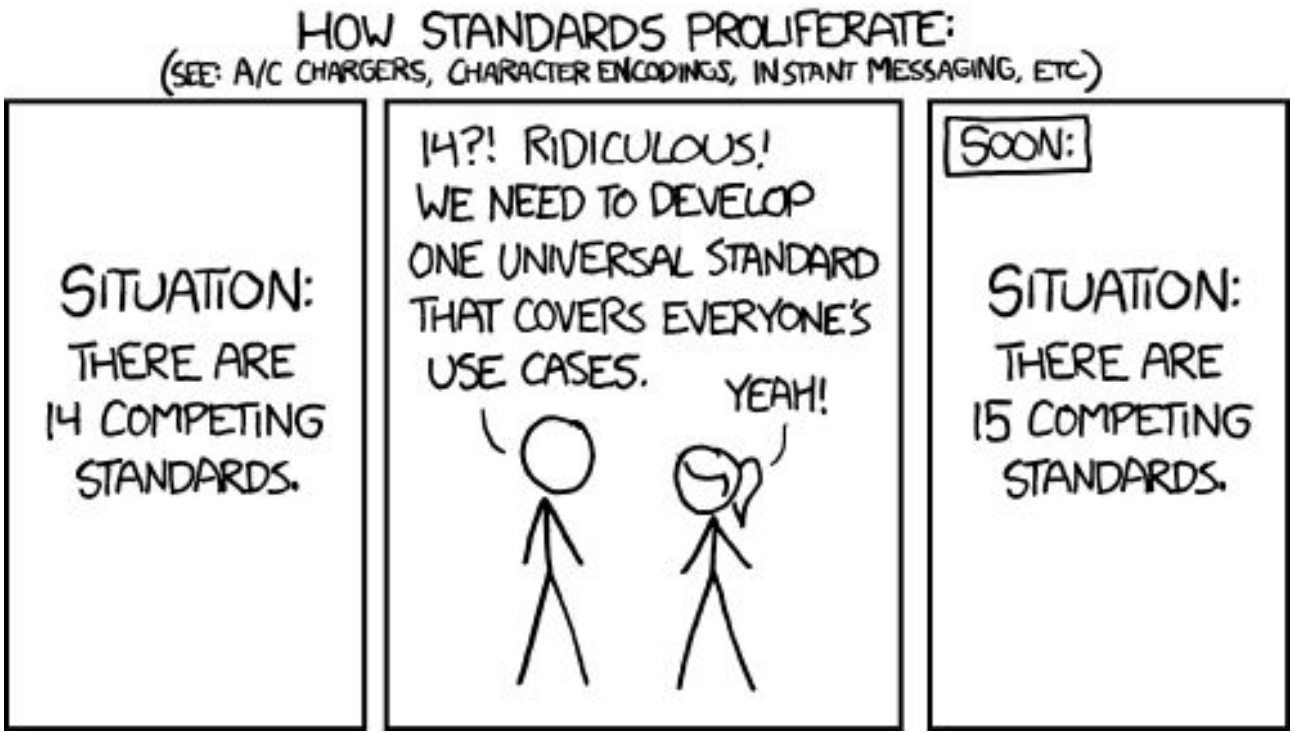
- Integrated security principles into the DevOps operations.
- Agile approach without losing security level.
- Sandboxing guide to test the dynamic properties of to-be-deployed infrastructure.
- Single source of truth, access control and accountability.
- Cloud-agnosticism.
- Automatic healing and optimisation.



PIACERE DevSecOps framework - A single universal platform
for DevSecOps deployments in multicloud enviroments. Including optimization of resources.

Actually Cross-Cloud and reusing and enhancing Open Source

PIACERE DevSecOps - why?



Source: https://xkcd.com/927/

PIACERE DevSecOps - why?

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- Simple and easy way to use DevSecOps approach.
- Unified way to build and deploy into the multicloud environments.
- Support for multiple IaC languages.
- Automatic deployment to different Cloud Providers.
- Automatic optimization of cloud resources.
- Embraces GitOps with single source of truth and streamlined access control.

openstack™

amazon web services™

Google Cloud Platform

Azure

PIACERE DevSecOps key elements

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- DOML - **D**evSec**O**ps **M**odelling **L**anguage
- VT - Verification Tool
- Central DOML&IaC repositories and Runtime Controller
- IEM - IaC Executor Manager
- Canary Sandbox Environment tooling
- Infrastructural Elements Catalogue
- Infrastructure Advisor
    - Runtime monitoring (performance and security)
    - IOP - Infrastructure Optimization Platform

Everything integrated together.

DOML - DevSecOps Modelling Language

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- Cloud-agnostic-able language.
- Multiple layers of modelling and presentation.
- Application modelling: components, connections, security, etc.
- Infrastructure modelling: **abstract** (environment-agnostic) and **concrete** (environment-dependent).
- Target IaC generation possible to multiple languages.
- Modelling toolbox available in Eclipse IDE.

Unified way of describing application and infrastructure in the Cloud, including security aspects such as rules and expectations.

VT - Verification Tool

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- Static analysis of properties of DOML and the generated IaC.
- Verifies correctness according to select criteria.
- Ensures the IaC and used components are free of known vulnerabilities and follow best security practices.

Unsure if your model satisfies expectations?
Refer to the Verification Tool of PIACERE.

(And it will make sure you don’t forget the Security part).

Central DOML&IaC repositories and Runtime Controller

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- Single-flow operations: push to the repository and get your deployment updated.
- Single source of truth - everything your infrastructure needs in one place.
- Simplified and streamlined access control - control access via repository permissions.
- Runtime Controller based on BPMN (Business Process Model and Notation) - an extensible vernacular.

One ~~ring~~ source to rule them all - Your deployments.

IEM - IaC Executor Manager

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- Execution of IaC.
- Understands the deployed infrastructure.
- Support for reconfiguration and scaling.
- Fully-automatic deployment to chosen Canary Environment and target infrastructure.
- Secure use of credentials to the target environments.

PIACERE is your smart, autonomic DevSecOps go-to product.

Canary Sandbox Environment tooling

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- **Two main tools:**
  - Provisioner - deployment of select environments (OpenStack, Kubernetes) in an opinionated way.
  - Mocklord - mocked APIs of selected cloud providers.
- Ability to test dynamic aspects of the deployment in a controlled, sandbox environment, including relevance, reliability and security tests.

PIACERE offers secure sandbox environment provisioning to help You test Your deployments.

Infrastructural Elements Catalogue

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- Central storage of local PIACERE knowledge.
- Answers the questions what providers are available and what their offers are. But it does not stop there!
- It stores the historic characteristics of the offers and their current usage along with any alarms (based on metrics and events from Infrastructure Advisor).

PIACERE is your smart, autonomic DevSecOps go-to product.

Infrastructure Advisor

Runtime monitoring (performance and security) & IOP - Infrastructure Optimization Platform

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- Collects metrics and events related to performance and security.
- Infrastructure-side deployed during IEM run.
- Self-learning and self-healing included.
- IOP - Optimization of the infrastructure based on collected metrics.
- Integration with Infrastructure Elements Catalogue to select best available options.
- Optimizes the trade-off of cost, performance, availability etc.
- Machine-learning-based optimization algorithms.

PIACERE optimizes Your infrastructure from DevSecOps process.

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www.piacere-project.eu

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