



OSLC for DevOps event-based automation

Guillermo García Grao

Agenda



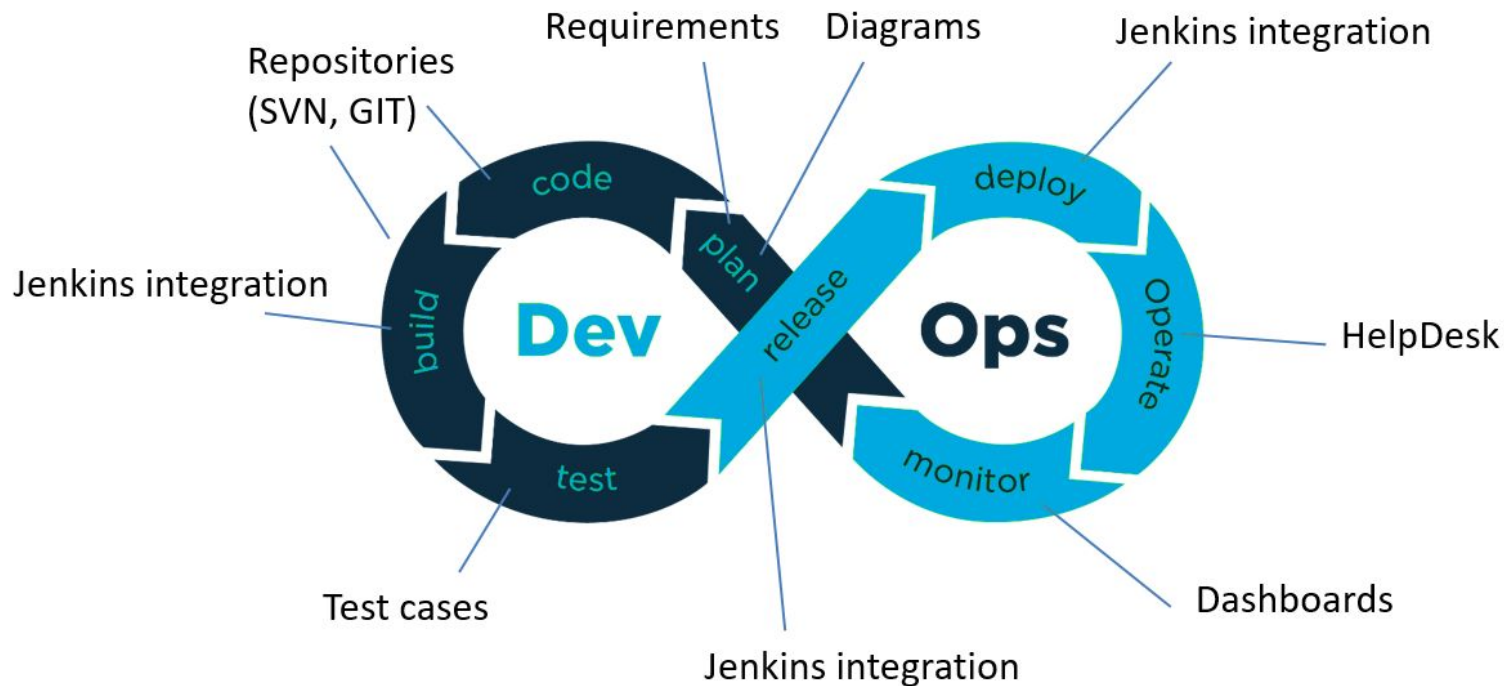
1. Introduction and Context
2. Integrating DevOps Services
3. Automation as a Service
4. Standardizing Event-based Automation
5. Case study

1.

Introduction and Context

DevOps:
definition and
challenges

Context



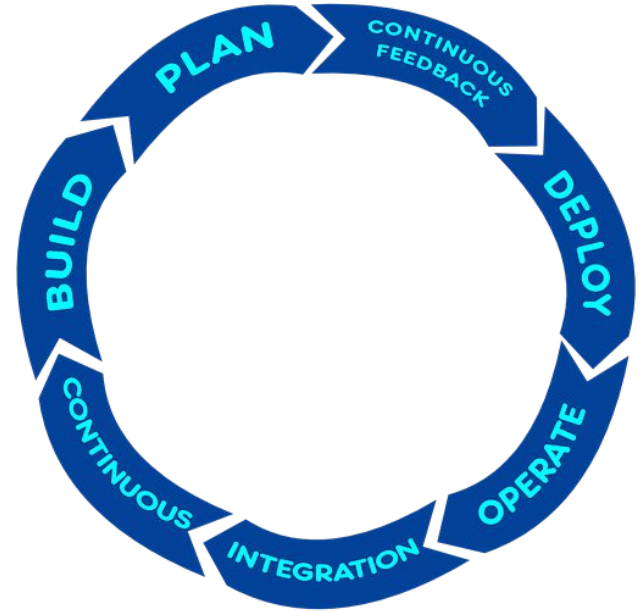


“A **collaborative** and **multidisciplinary** effort within an organization to **automate continuous delivery** of new software versions, while guaranteeing their **correctness** and **reliability**.”

Leite et. al. (2019). A survey of DevOps concepts and challenges.

DevOps Goal

Faster application
production, integration
and **delivery**.





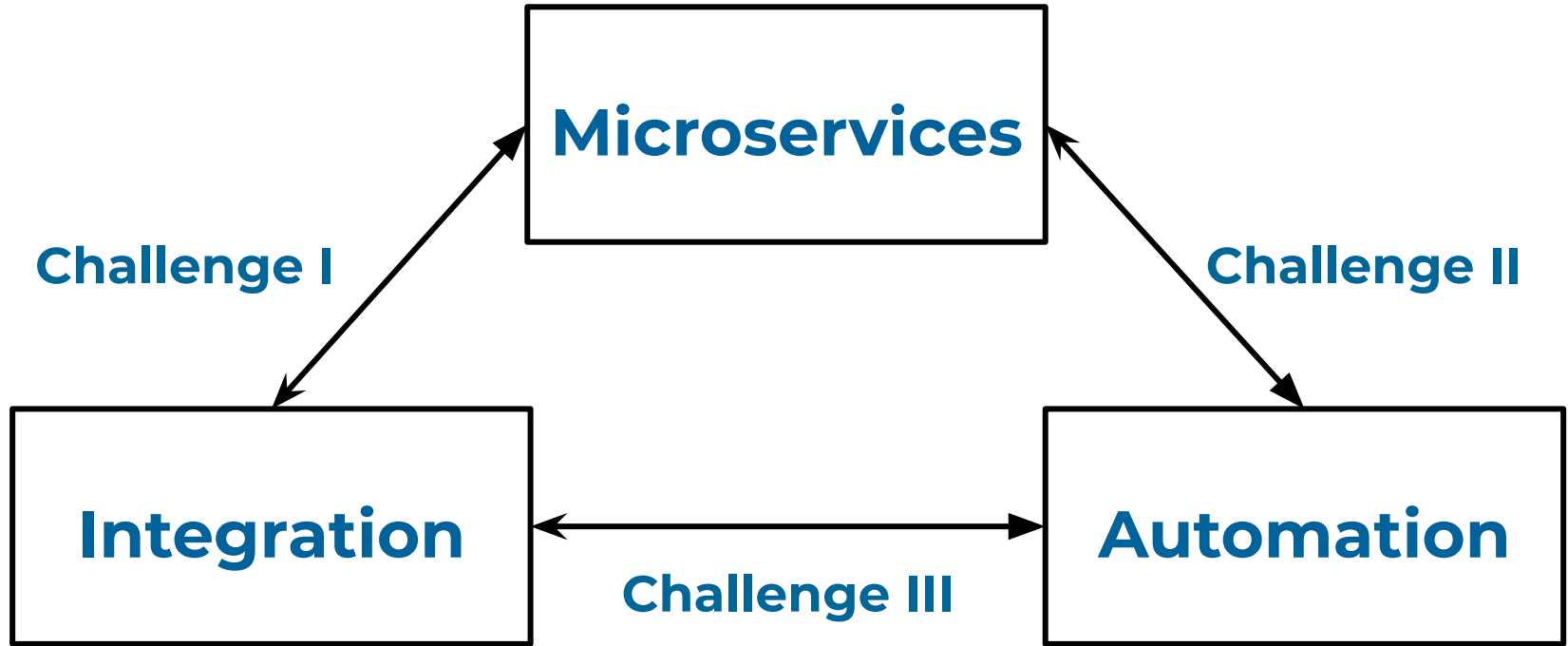
Desired DevOps Features

- ▣ **Scalability**
 - ▣ Microservices architecture

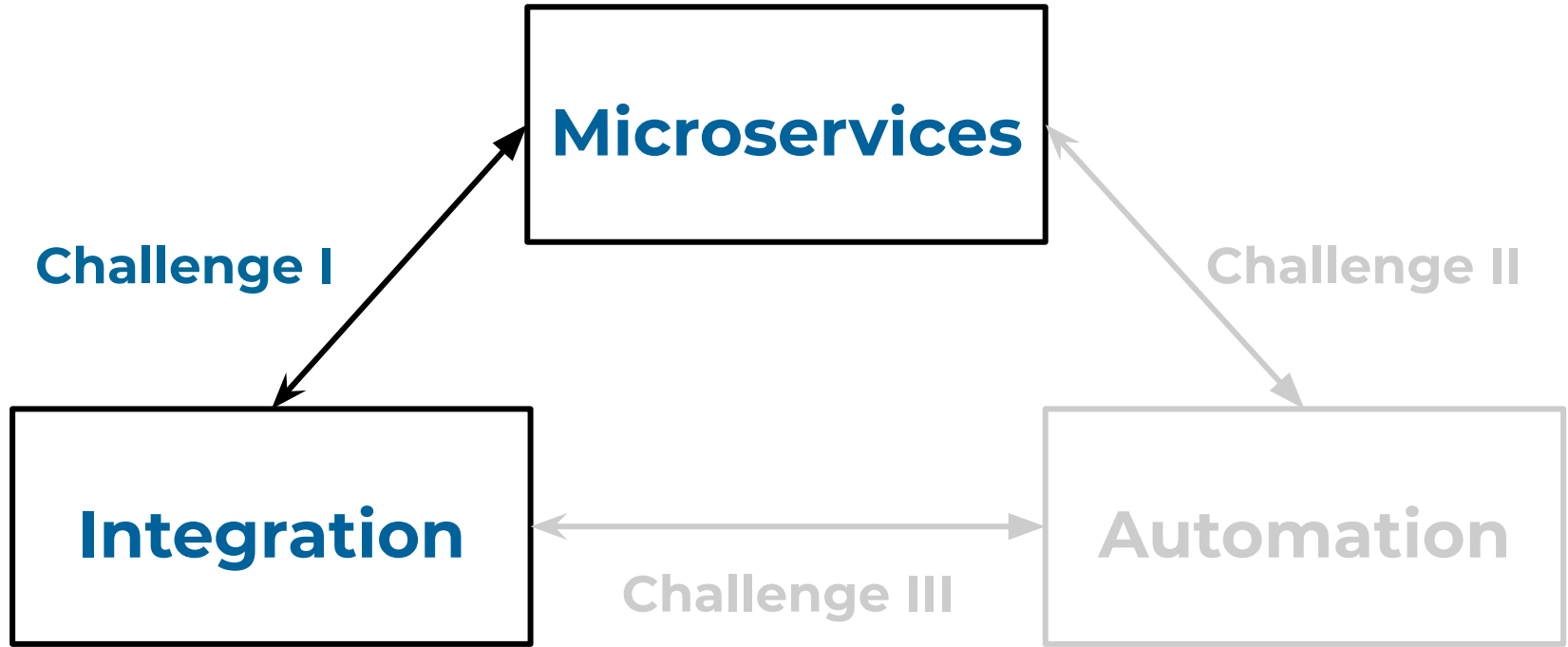
- ▣ **Adaptability** to rapid changes
 - ▣ Fast services integration

- ▣ **Automation:** building, testing, deployment
 - ▣ Continuous Delivery (CD)

DevOps Challenges



DevOps Challenges



2.

Challenge I

Integrating
DevOps
Services



Challenge I - Presentation

Microservices vs Adaptability:

- ▣ **Expensive** to migrate APIs
- ▣ **Vendor lock-in**
- ▣ Lack of **flexibility** and **versatility**

Challenge I - Current State

- ▣ Manual migrations
 - ▣ Slow
 - ▣ Expensive
- ▣ Non-standardized APIs
 - ▣ Hard to cover every possible tool
 - ▣ Lack of flexibility for developers

Challenge I - Potential Solution



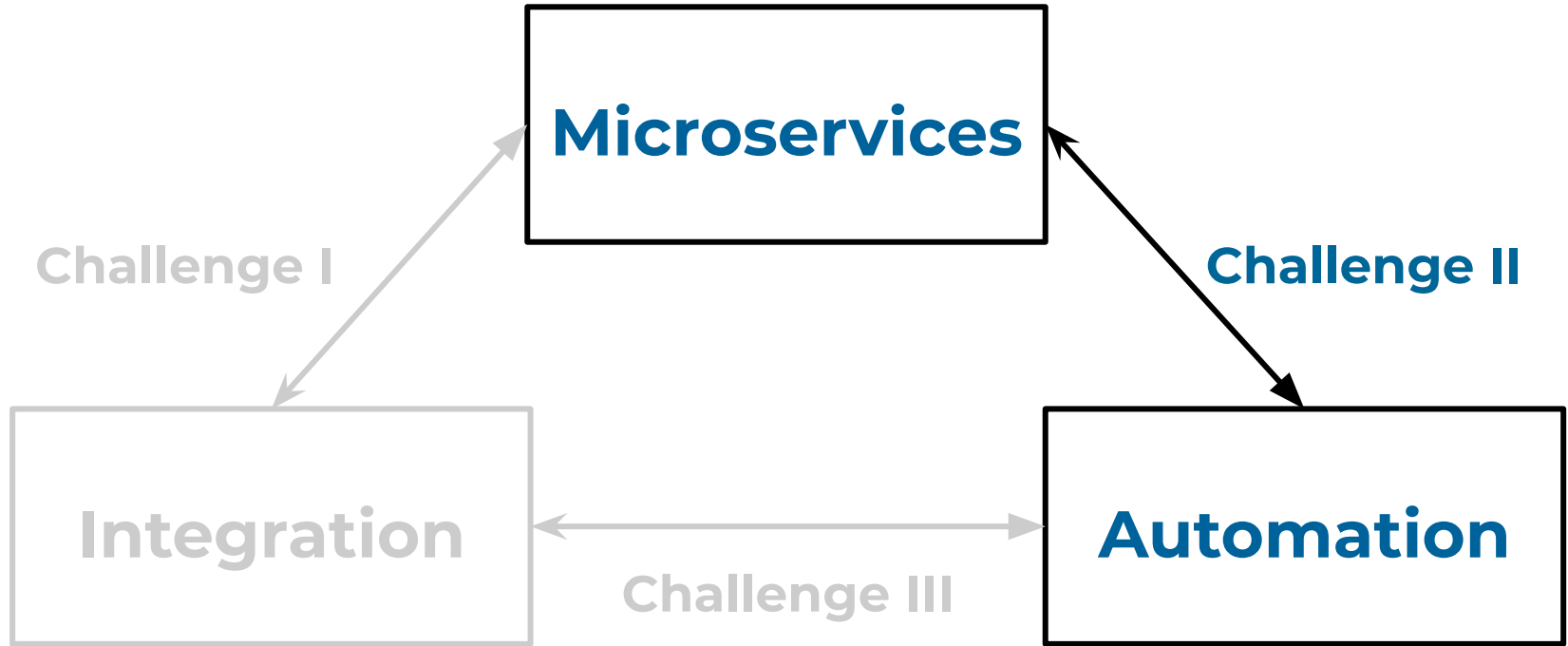
OSLC



Challenge I - Potential Solution

- ▣ **Seamless integration** between compliant tools
- ▣ **No assumptions** about tool's internal structure
- ▣ Flexible model: **Linked Data**

DevOps Challenges



3.

Challenge II

Automation as
a Service



Challenge II - Presentation

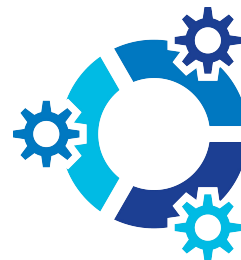
Microservices and Automation:

- ▣ Service that **provides automation**
- ▣ Concept: **Automation as a Service**
- ▣ Implementation: **Task Automation Server**

Challenge II - Current State

Task Automation Servers (TAS)

- ▣ Provide **automation capabilities** to other services
- ▣ Based on the **ECA model**
 - ▣ **Event** triggered
 - ▣ **Condition** evaluated
 - ▣ **Action** executed



Challenge II - Current State

User applications:




Automatelt

DevOps:



Challenge II - Current State




CX Pack

Integration pack for Aruba's AOS-CX switch.

aoscx **aruba** **aos-cx**


v1.0.2
Aruba Networks, a Hewlett-Packard Enterprise company
Supported Python versions: Python 3.x



astral

triggers for sunrise/sunset information


v1.0.0
Supported Python versions: Python 3.x



ansible integrations

ansible **cfg management** **configuration management**

v1.0.0
Supported Python versions: Python 3.x




aws

st2 content pack containing Amazon Web Services integrations.

aws **amazon web services** **amazon** **ec2** **sqs** **sns** **route53** **cloud** **iam** **vpc** **s3** **CloudFormation** **RDS** **SQS** **lambda** **kinesis**

v2.0.1
Supported Python versions: Python 3.x




aws_boto3

AWS actions using boto3

aws **amazon web services** **amazon** **boto3** **ec2** **sqs** **sns** **route53** **cloud** **iam** **vpc** **s3** **CloudFormation** **RDS** **SQS** **lambda**

v1.0.0
Supported Python versions: Python 3.x




aws_s3

AWS S3-specific actions

aws **amazon web services** **amazon** **s3**

v2.0.3
Supported Python versions: Python 3.x




azure

Microsoft Azure integrations.

microsoft **azure** **cloud** **libcloud** **servers** **virtual machines** **azure virtual machines** **azurerm**

v1.0.0
Supported Python versions: Python 3.x




beertab

StackStorm pack for keeping track of people who owe you beer.

beer **tab** **fun**

v1.0.0
Supported Python versions: Python 3.x




bitbucket

Pack which allows integration with Bitbucket.

bitbucket **vcs** **mercurial** **git** **source control**

v1.0.1
Supported Python versions: Python 3.x




backups

Pack to backup StackStorm databases

backup **database** **postgres** **postgresql** **mongo** **mongodb**

v2.0.0
Supported Python versions: Python 3.x




bitcoin

bitcoin integration pack


bitcoin

v1.0.0
Supported Python versions: Python 3.x




cassandra

Apache Cassandra Integrations



check_mk

Check_MK integrations



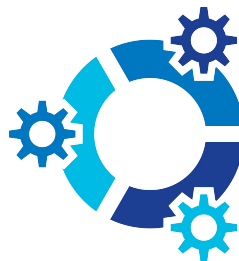
bolt

StackStorm integration pack for Puppet Bolt

Challenge II - Current State

Task Automation Servers (StackStorm)

- ▣ How to migrate automations?
- ▣ **Vendor lock-in**... again





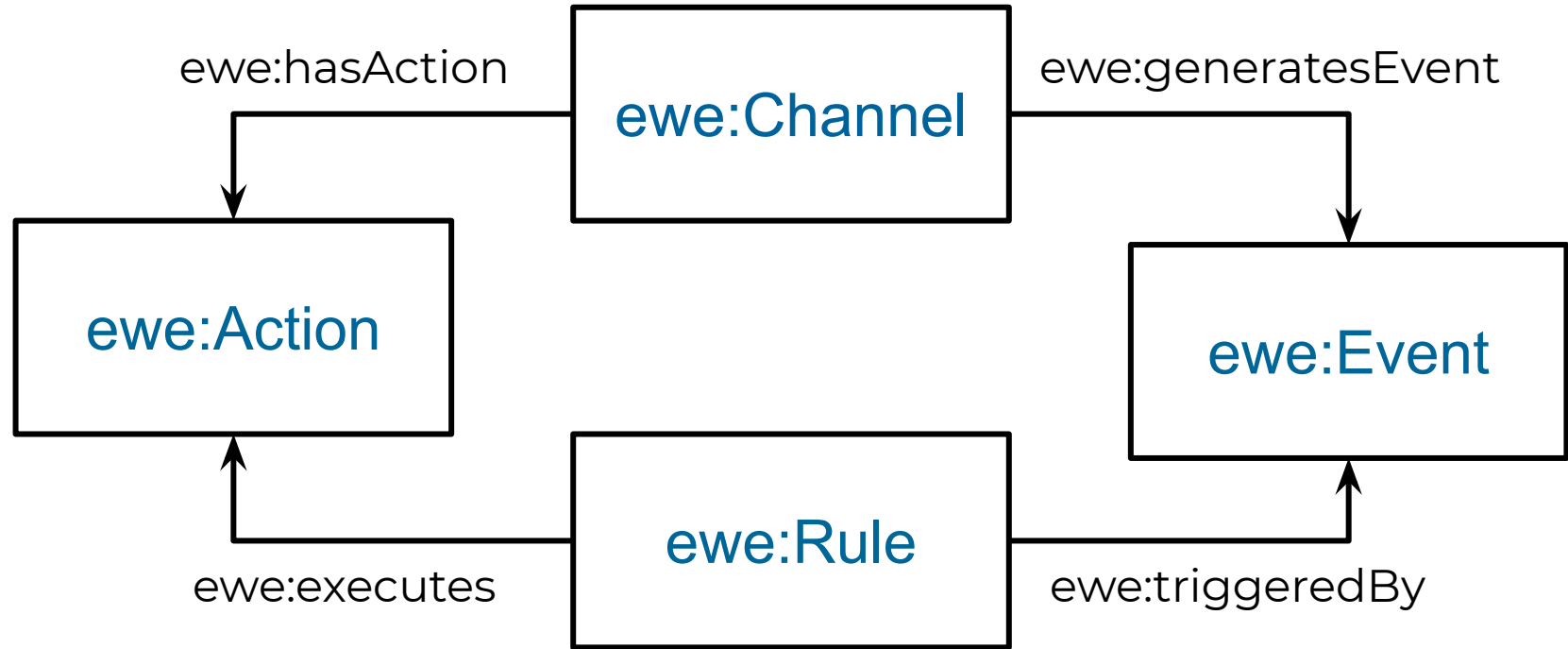
Challenge II - Potential Solution

- ▣ **Semantic** model for TAS
- ▣ Rule **interoperability**
- ▣ **EWE** (Evented WEb) ontology



Challenge II - Potential Solution

- ▣ **Semantic** model for TAS
- ▣ Rule **interoperability**
- ▣ **EWE** (Evented WEb) ontology
 - ▣ Linked Data flexibility
 - ▣ Reasoning capabilities



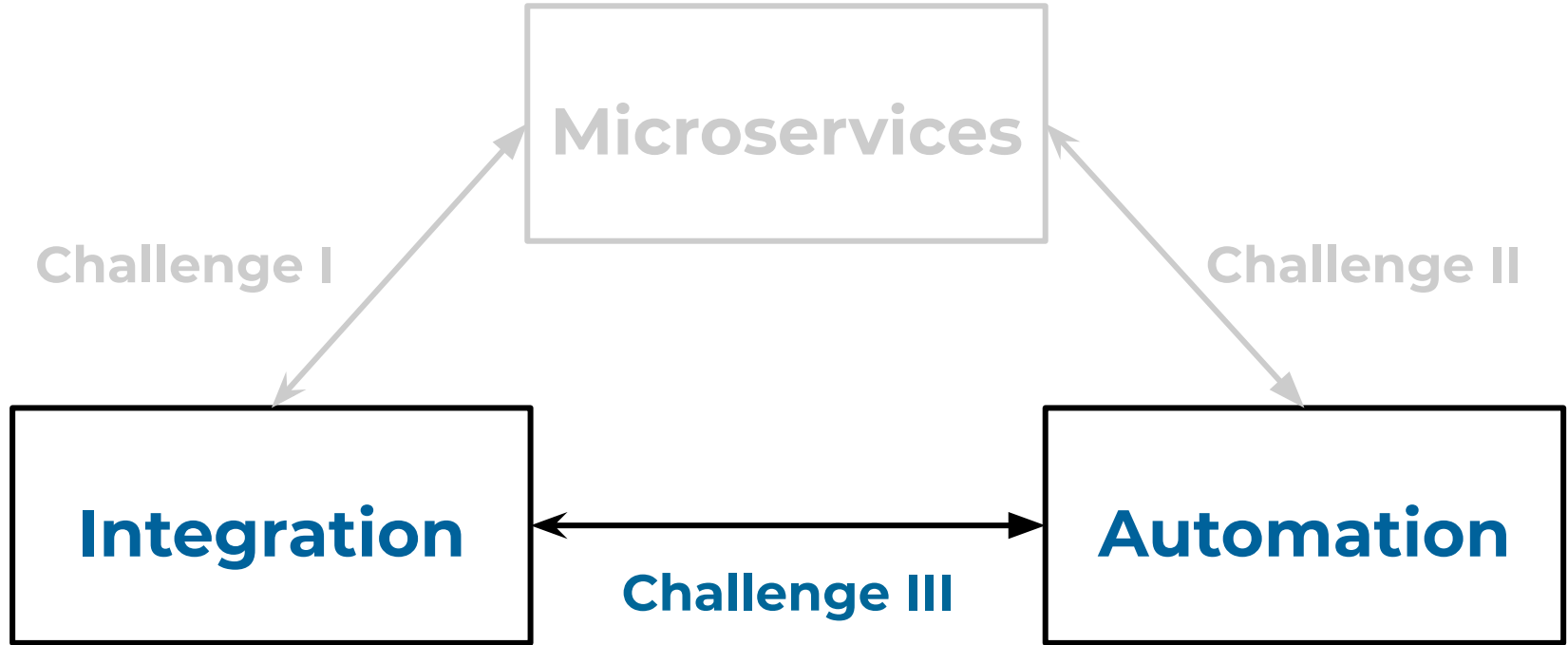
EWEE model simplified

Challenge II - Potential Solution

EWE Tasker

- ▣ TAS implementation **based on EWE** semantic model
- ▣ Rule engine: **EYE reasoner**

DevOps Challenges



4.

Challenge III

Standardizing
Event-based
Automation



Challenge III - Presentation

**Standardized
interfaces** between
services



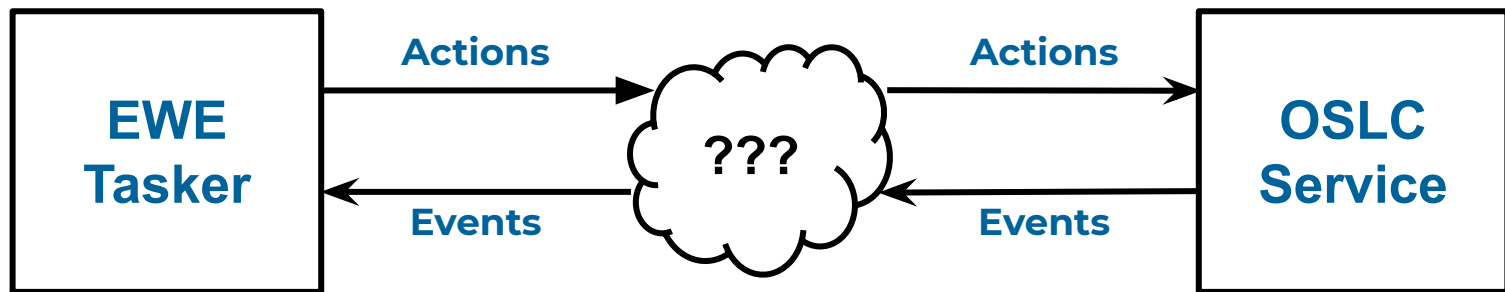
Semantic modeling
for Task Automation
Servers





Challenge III - Presentation

- Interaction between **TAS** and **OSLC Services**





Challenge III - Presentation

- Interaction between **TAS** and **OSLC Services**



Challenge III - Current State

OSLC Automation:

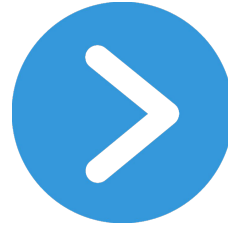
- ▣ Should be **extended**
- ▣ OSLC **interface for TAS**

Challenge III - Current State

Events in OSLC



Actions in OSLC

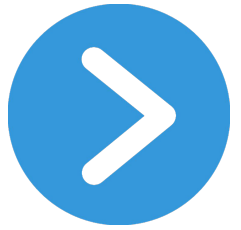




Challenge III - Current State

Events in OSLC

- ▣ **Tracked Resource Set** (TRS)
 - ▣ Creation, Modification, Deletion
 - ▣ TRS Patch for more complex events (TRS 3.0)
- ▣ **New spec** (?)



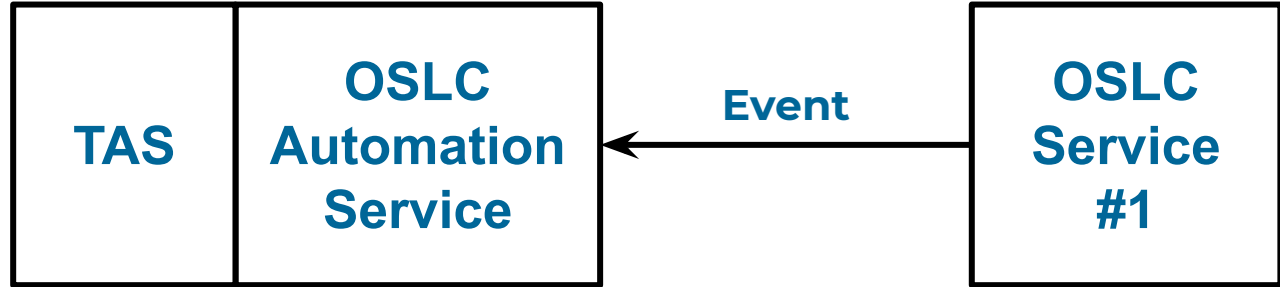
Challenge III - Current State

Actions in OSLC

- ▣ **CRUD** (Create, Read, Update, Delete)
 - ▣ HTTP POST, PUT and DELETE methods
- ▣ **OSLC Actions** (?)

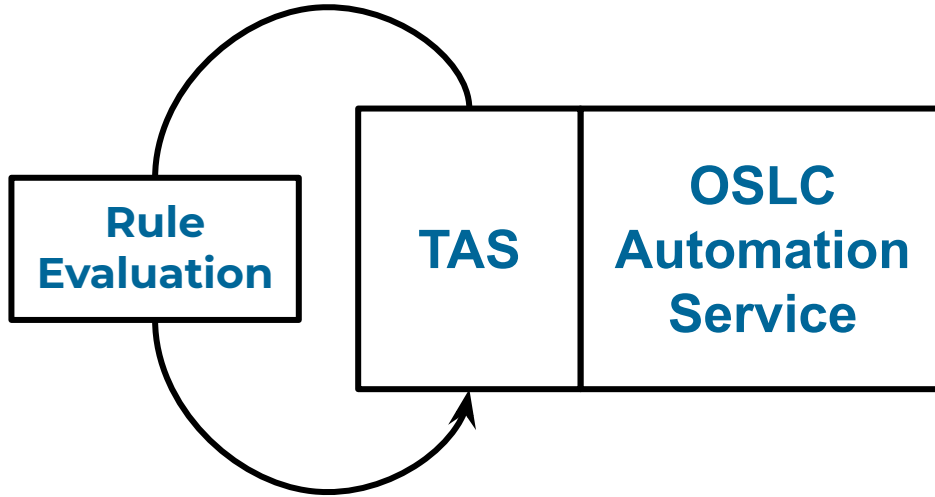
Challenge III - Potential Solution

OSLC Automation + **TAS**



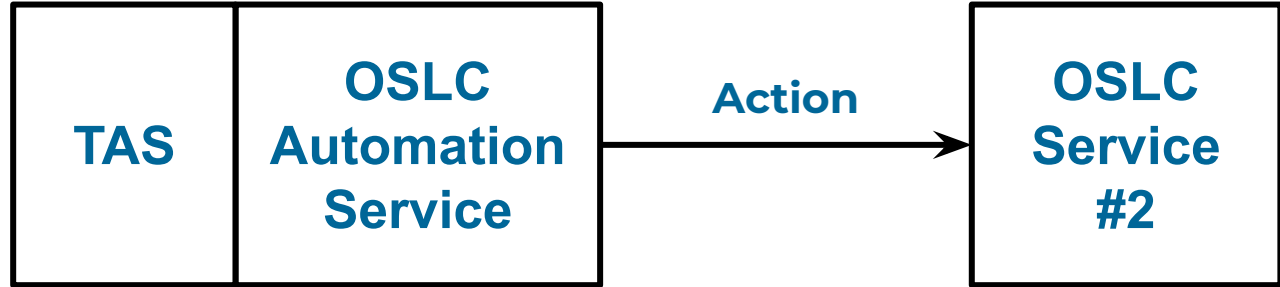
Challenge III - Potential Solution

OSLC Automation + **TAS**



Challenge III - Potential Solution

OSLC Automation + **TAS**



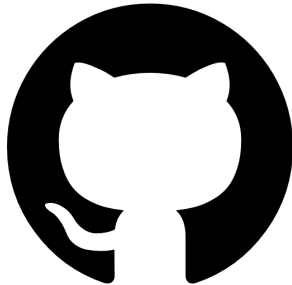
4.

Case study

Github -
Bugzilla
integration

Case Study - Proposal

Development team
uses **GitHub**



Testing team uses
Bugzilla





Case Study - Goals

- ▣ Replicate the bugs from Bugzilla as issues in GitHub (and viceversa) **automatically**



Case Study - Goals

- Replicate the bugs from Bugzilla as issues in GitHub (and vice versa) **automatically**
- Using **OSLC interfaces** between the services



Case Study - Goals

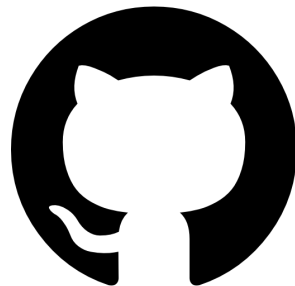
- Replicate the bugs from Bugzilla as issues in GitHub (and viceversa) **automatically**
- Using **OSLC interfaces** between the services
- TAS with **semantic rules** support



Case Study - OSLC Interfaces

Bugzilla

- ▣ oslc:ServiceProviders - **Products**
- ▣ Resources - **Bugs**
- ▣ Domain - **ChangeManagement**

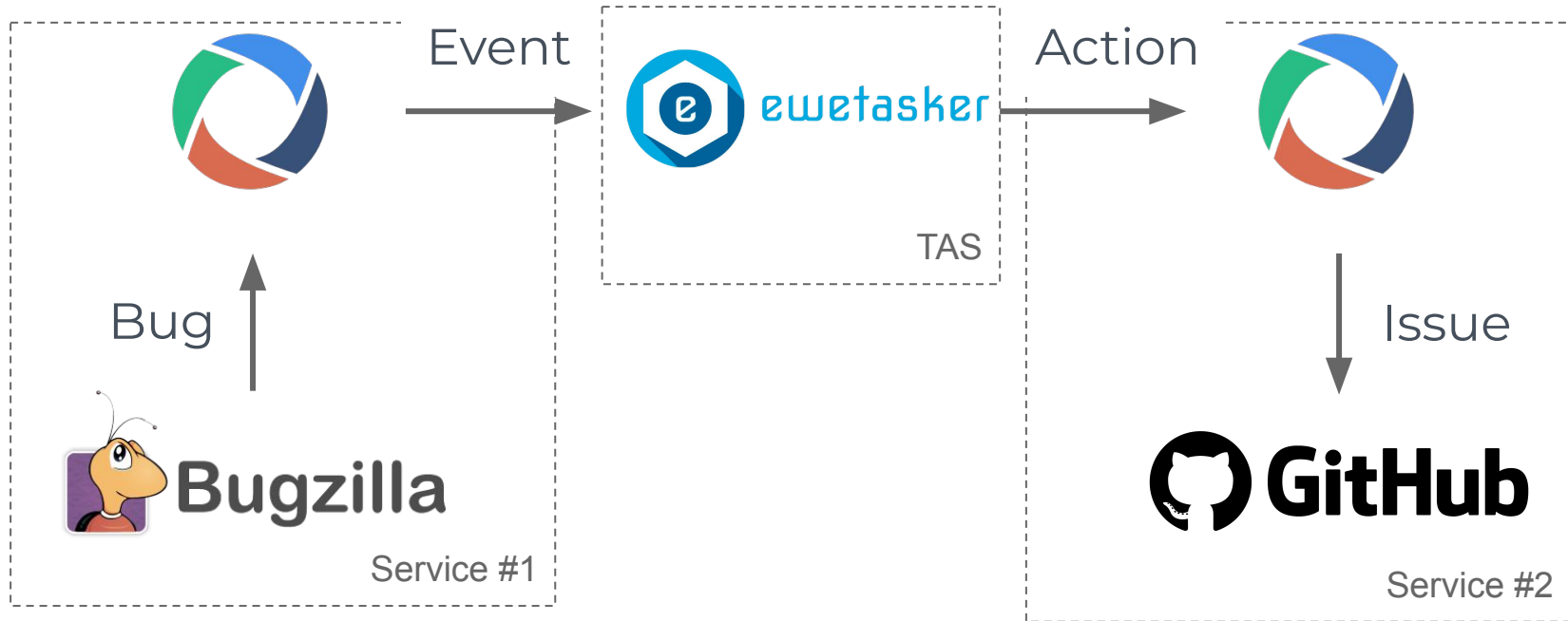


Case Study - OSLC Interfaces

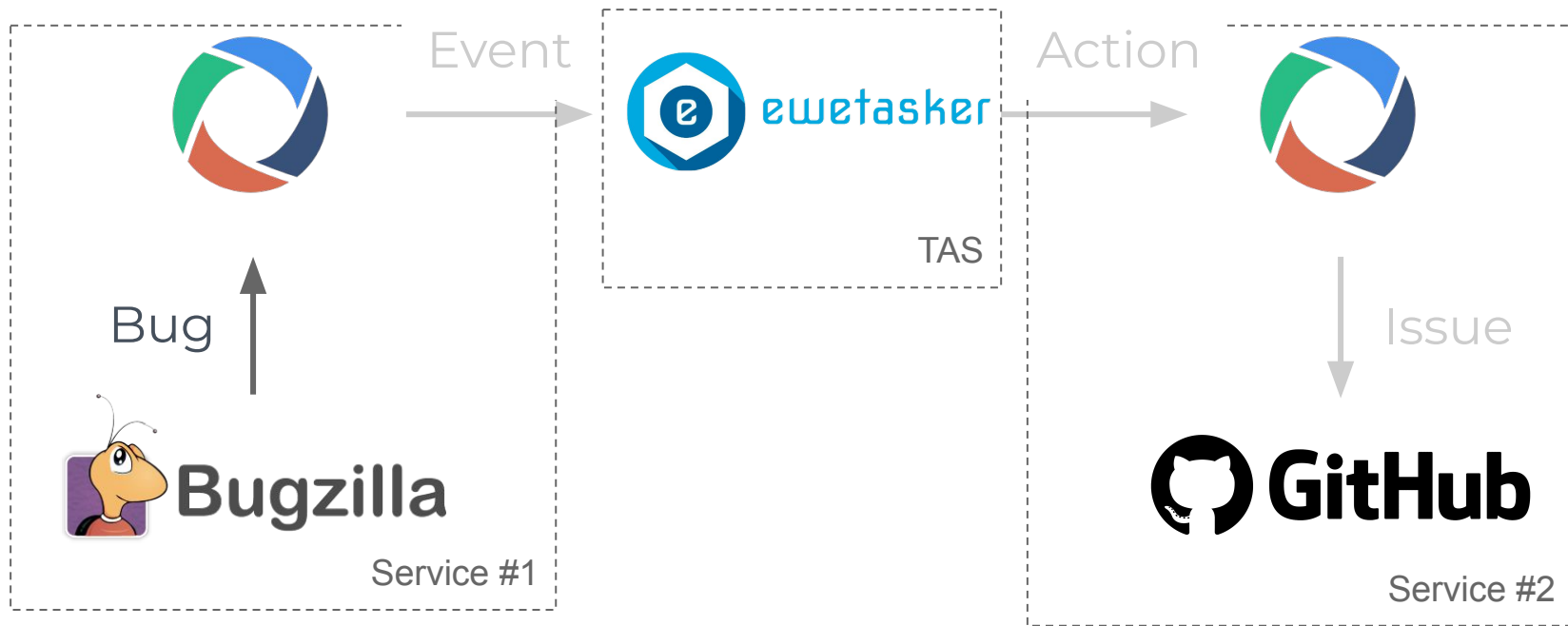
GitHub

- ▣ oslc:ServiceProviders - **Repositories**
- ▣ Resources - **Issues**
- ▣ Domain - **ChangeManagement**

Case Study - Scenario

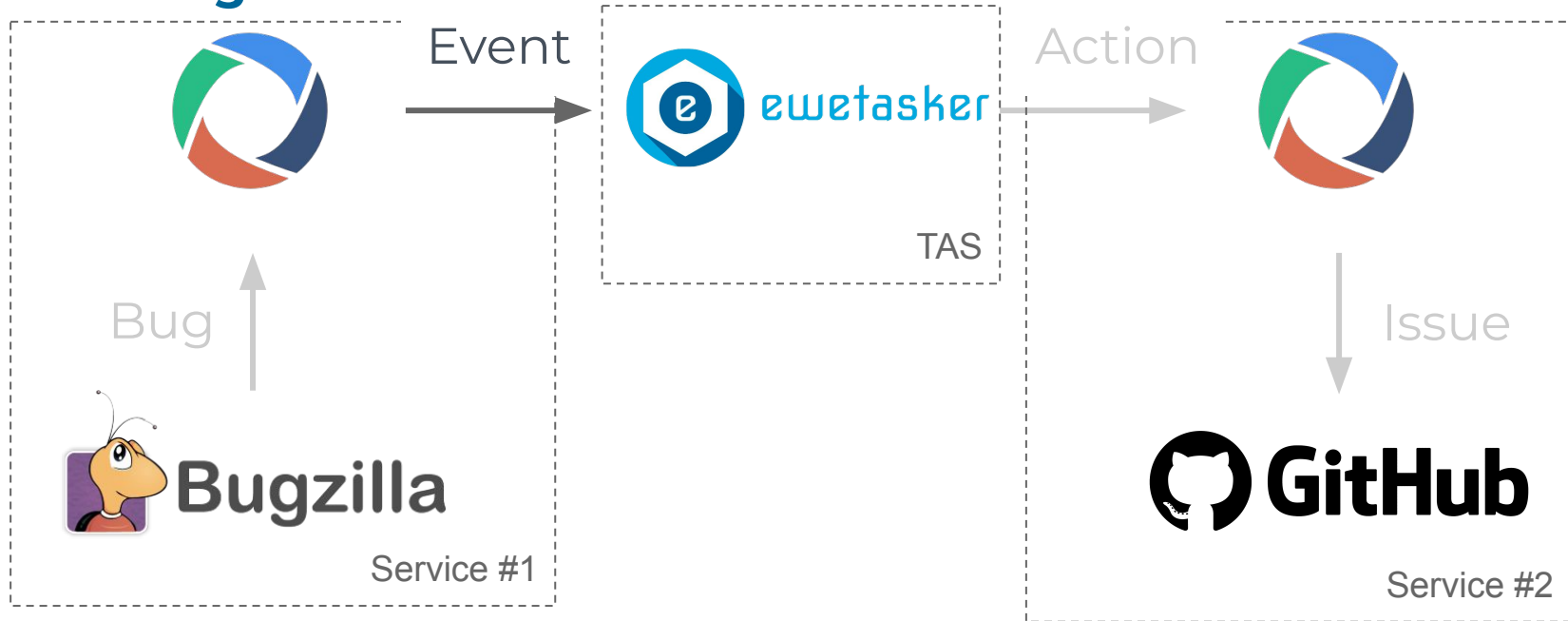


Case Study - Scenario

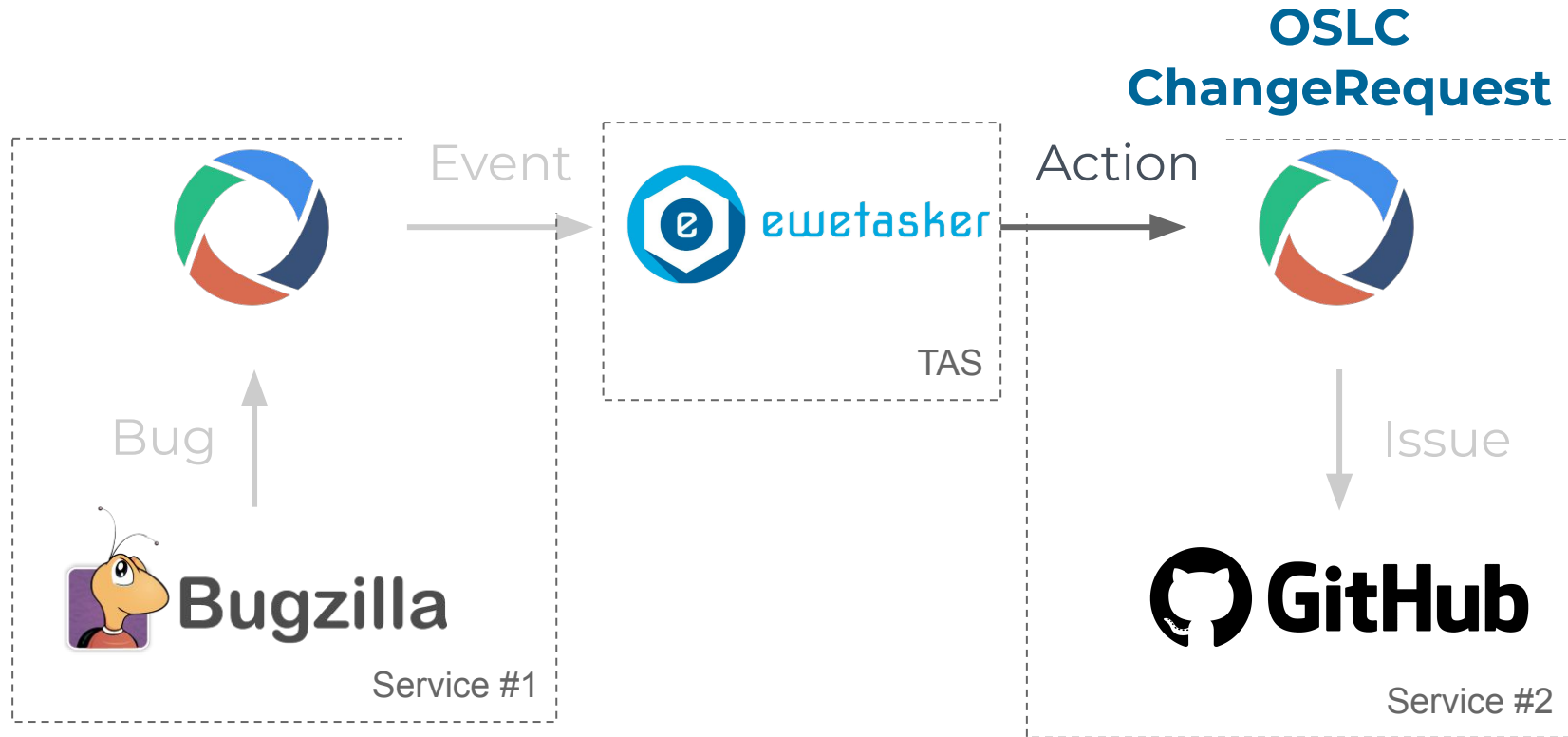


Case Study - Scenario

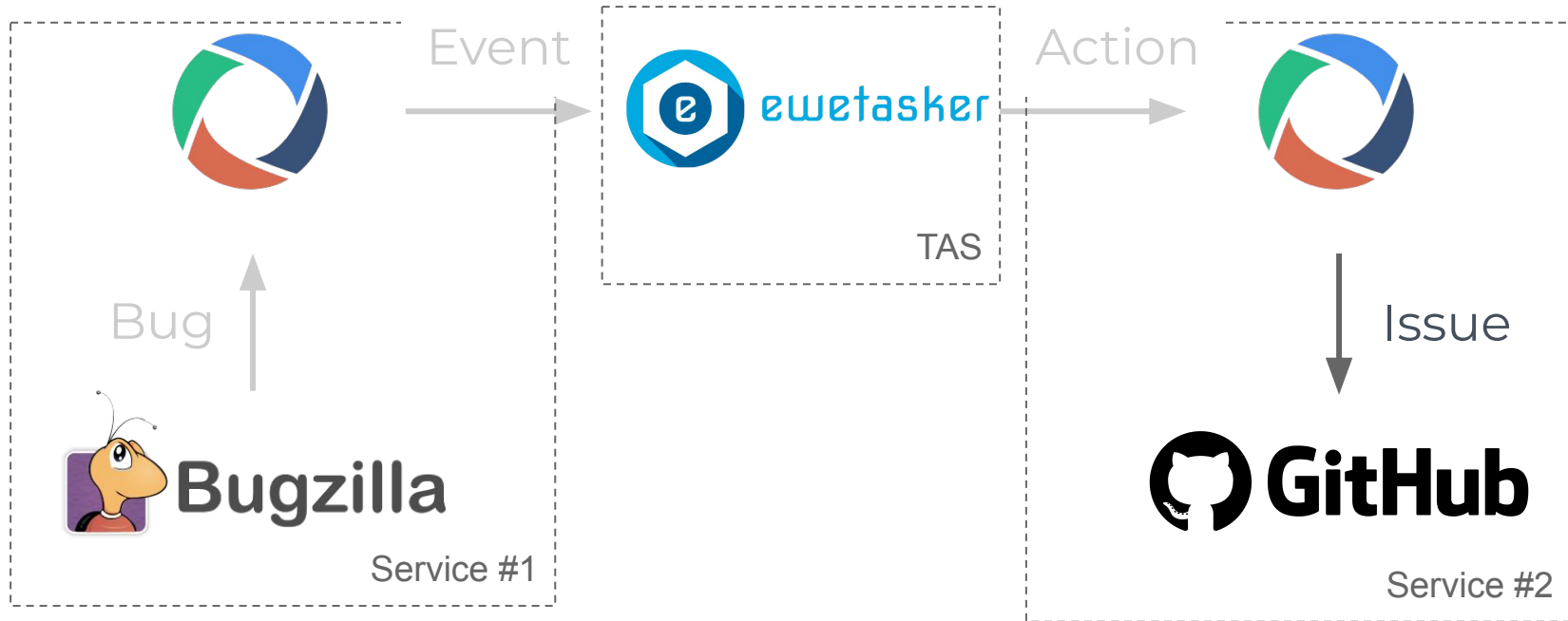
TRS ChangeEvent



Case Study - Scenario



Case Study - Scenario





Case Study - Results

Desired **DevOps** features

- ▣ Supports **microservices architectures**
- ▣ **Fast integration** with new services
- ▣ Provide **automation features**

Case Study - Future Work

- ▣ Extension for **OSLC Automation** covering TAS features
- ▣ **OSLC Events** (new spec?)
- ▣ **OSLC Actions** (reactivate?)

Questions?

GSI contact email - gsi@autolistas.upm.es

Guillermo García-Grao - g.ggrao@upm.es