

Eclipse Xpanse 

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## About Me

- > Based in Munich, Germany.
- > Currently working at Huawei as Principal Engineer.
- > Actively contributing to eclipse-xpanse since beginning of this year.

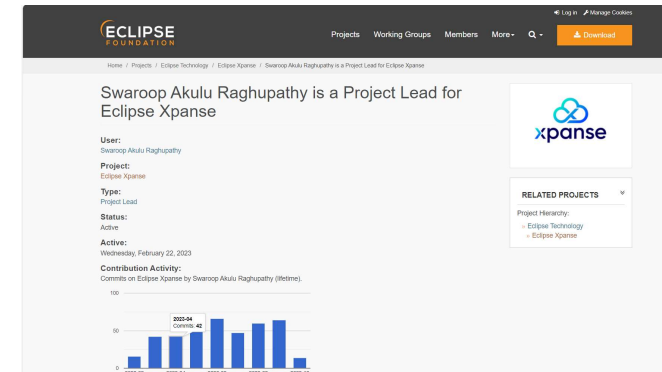


**Principal Engineer**

Huawei · Full-time

Jan 2023 - Present · 10 mos

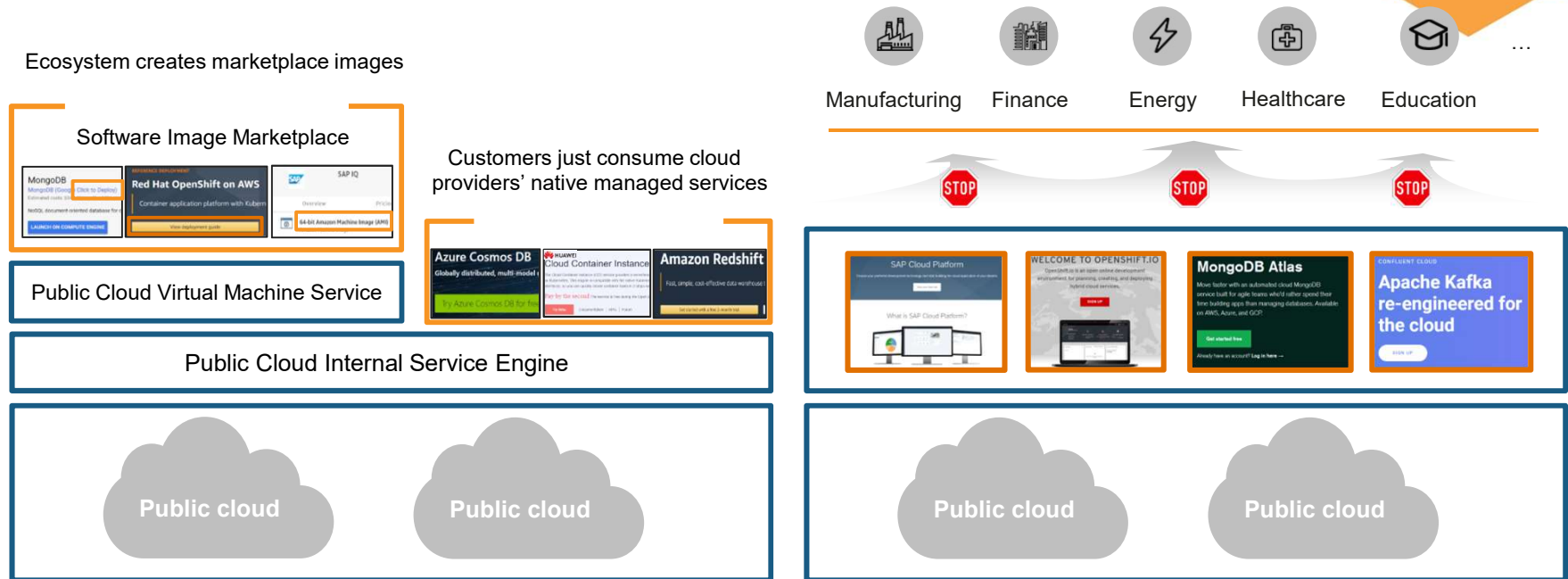
Munich, Bavaria, Germany · On-site





## Background – Open Services Cloud (OSC)

# The Ecosystem Is Being Locked Out Of Public Clouds



- The ecosystem is being Locked Out of public clouds because they cannot create native managed services.
- No access to internal management APIs
- Lockout Effect:  
Hard to integrate 3rd party SaaS islands

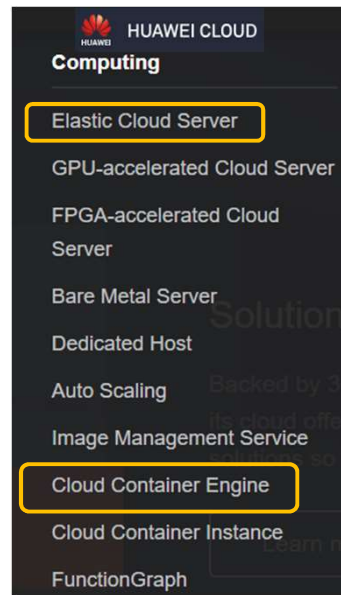
# Enterprises Fear Lock-in

## Multi-Cloud Goes To The Least Common Denominator



**Compute**

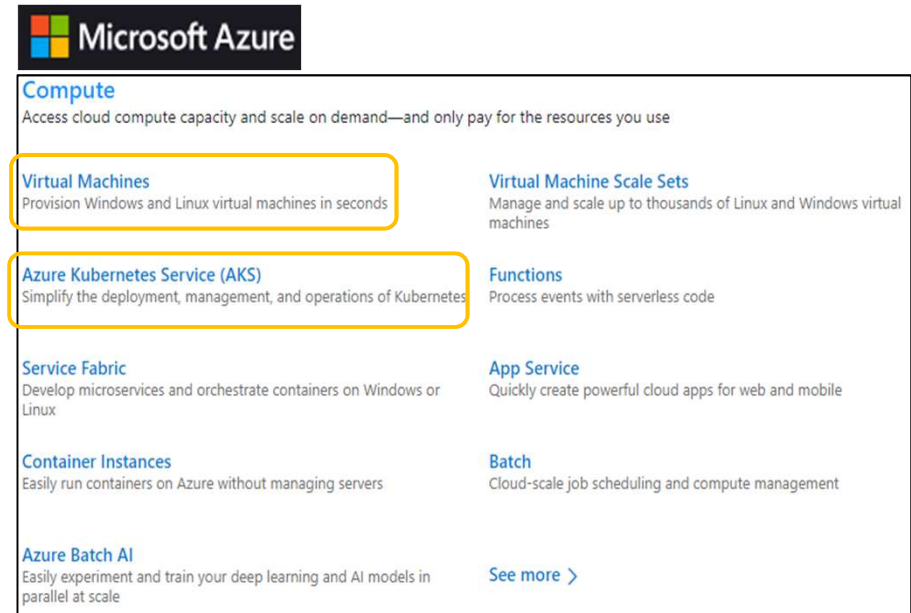
- Amazon EC2**  
Virtual servers in the cloud
- Amazon EC2 Auto Scaling**  
Scale compute capacity to meet demand
- Amazon EC2 Container Registry**  
Store and retrieve docker images
- Amazon Elastic Container Service**  
Run and manage docker containers
- Amazon Elastic Container Service for Kubernetes**  
Run managed Kubernetes on AWS
- Amazon Lightsail**  
Launch and manage virtual private servers
- AWS Batch**  
Run batch jobs at any scale
- AWS Elastic Beanstalk**  
Run and manage web apps
- AWS Fargate**  
Run containers without managing servers or clusters
- AWS Lambda**  
Run code without thinking about servers



**HUAWEI CLOUD**

**Computing**

- Elastic Cloud Server**
- GPU-accelerated Cloud Server**
- FPGA-accelerated Cloud Server**
- Bare Metal Server**
- Dedicated Host**
- Auto Scaling**
- Image Management Service**
- Cloud Container Engine**
- Cloud Container Instance**
- FunctionGraph**



**Microsoft Azure**

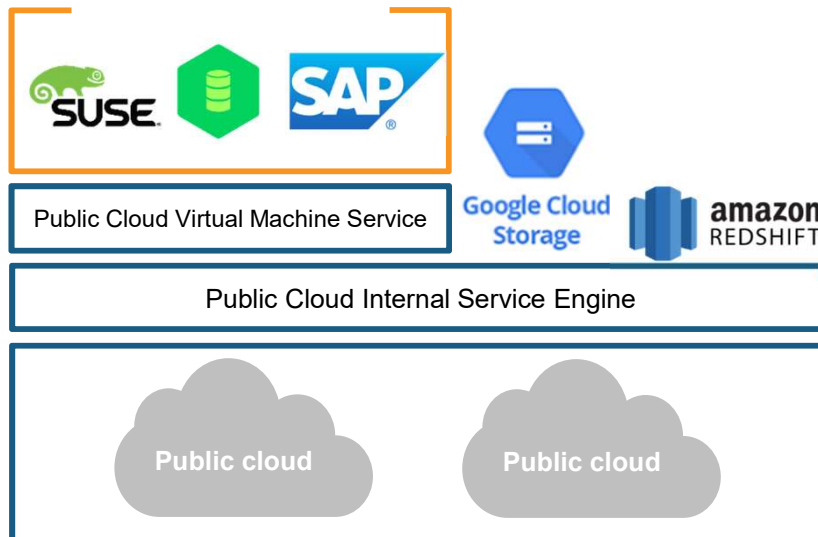
**Compute**  
Access cloud compute capacity and scale on demand—and only pay for the resources you use

- Virtual Machines**  
Provision Windows and Linux virtual machines in seconds
- Virtual Machine Scale Sets**  
Manage and scale up to thousands of Linux and Windows virtual machines
- Azure Kubernetes Service (AKS)**  
Simplify the deployment, management, and operations of Kubernetes
- Functions**  
Process events with serverless code
- Service Fabric**  
Develop microservices and orchestrate containers on Windows or Linux
- App Service**  
Quickly create powerful cloud apps for web and mobile
- Container Instances**  
Easily run containers on Azure without managing servers
- Batch**  
Cloud-scale job scheduling and compute management
- Azure Batch AI**  
Easily experiment and train your deep learning and AI models in parallel at scale

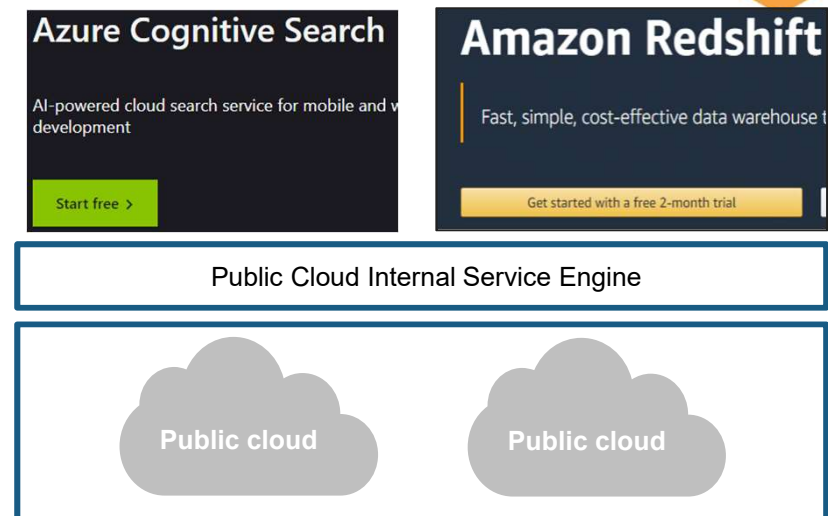
[See more >](#)

There is no service portability between different clouds!

# Cloud Data: The Ultimate Lock-Out and Lock-In



- **Lock-out:** Cloud data storage *software* is inefficient vs cloud data storage *service*
- Layering software storage on a purchased virtual machine is inefficient and expensive compared to native cloud storage services



- **Lock-in:** Cloud data is tightly coupled to proprietary cloud services
- Hard to extract/export raw data from one cloud to another
- Even if cloud data can be exported, it is not useful without accompanying cloud service

# Solution Proposed By OSC

## Software Vendor

- Provide managed service on every cloud
- Develop once, deploy many (Public, Private, Hybrid clouds)

## Open Services Cloud

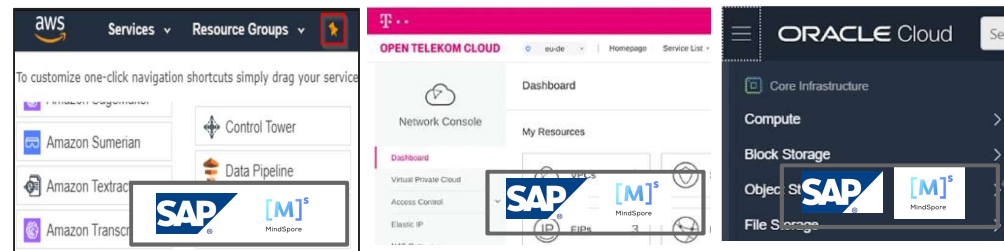
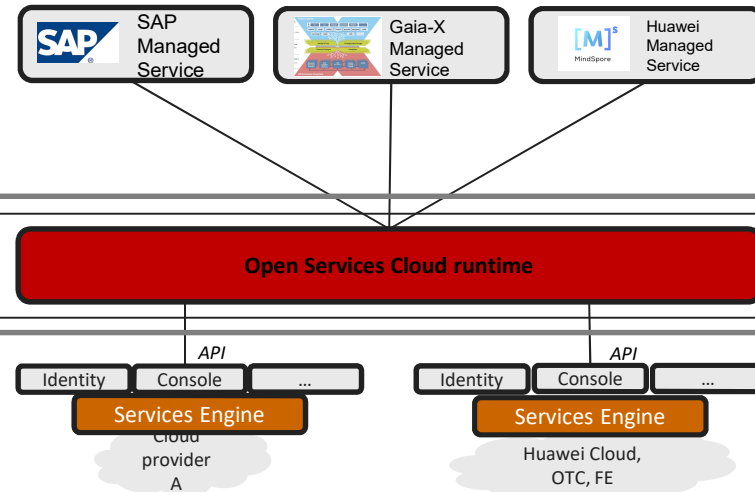
runtime & orchestrator

## Cloud Service Provider

- Revenue sharing with software vendors
- One stop shop for customers

## Customer

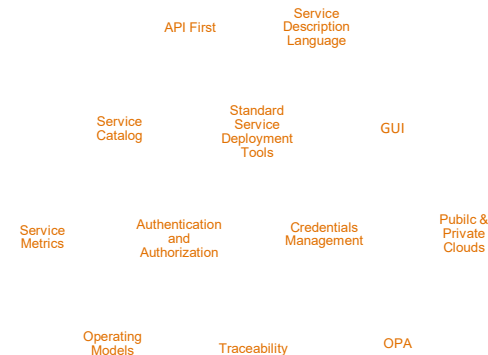
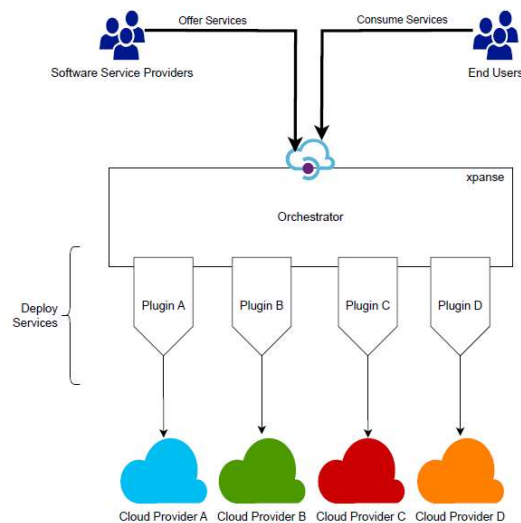
- Get everything as managed service
- Seamless integration in cloud of his choice
- Seamless portability within clouds
- Unified (Single) Billing, IAM, Logging and CloudOps



# Eclipse Xpanse – An OSC Project



Xpanse is an Eclipse Foundation incubated project under OSC working group which aims to build a framework to offer and consume native cloud services in an unified and fully portable way.

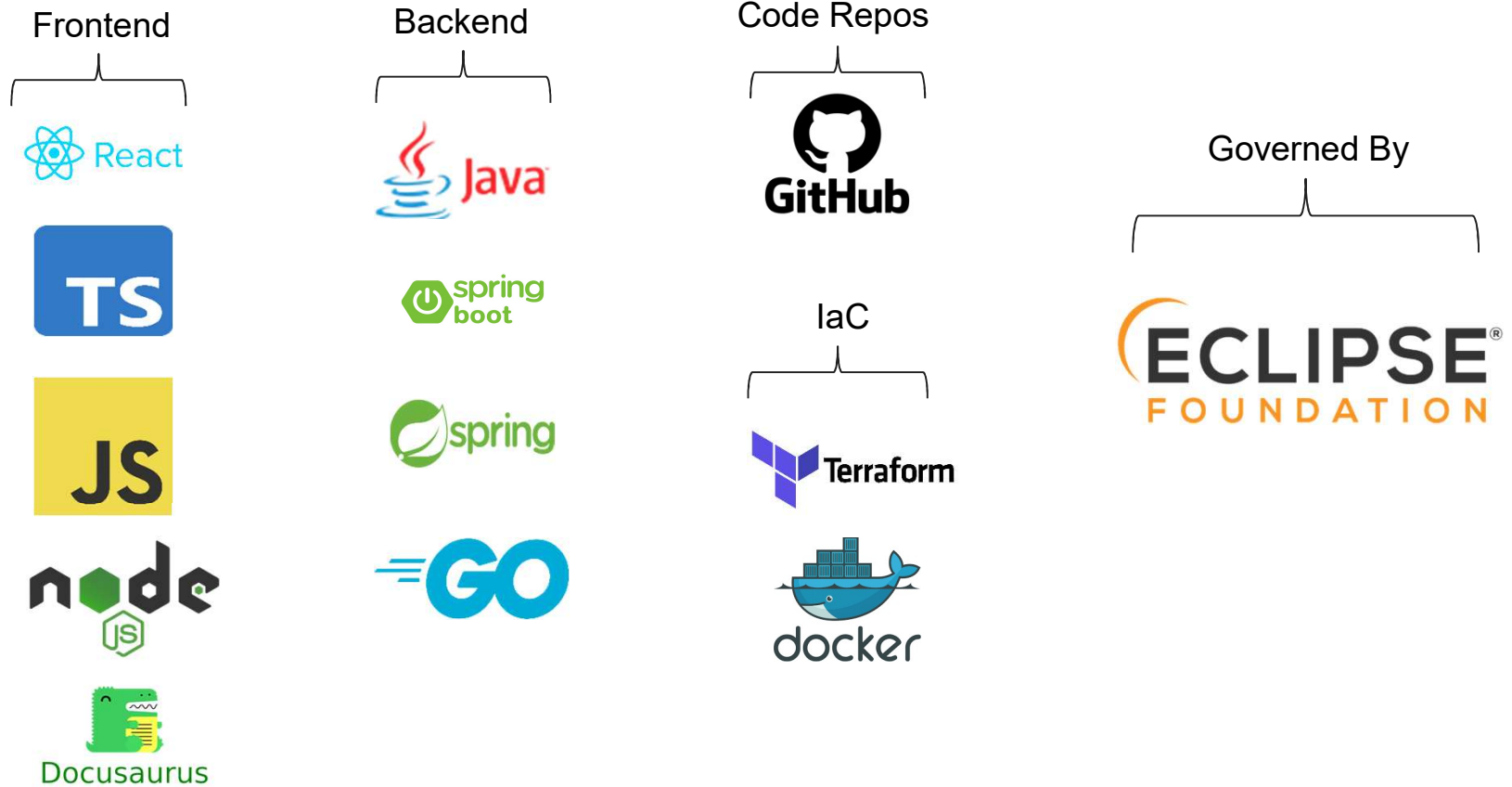






## Live Demo

## Eclipse Xpanse – Tech Stack





## Features Extensibility

All functionalities can be switched

- > OAUTH – Zitadel can be replaced with any other identity provider.
- > DB – MySQL can be replaced with any Database.
- > Plugins can be enabled, disabled, added as required.
- > Service deployers can be added as required.
- > Terraform-boot can be enabled/disabled.

## Possible Operating Models

- > One central Xpanse runtime.
- > One Xpanse runtime on each cloud.
- > Run Xpanse on enterprise/teams to work as self-service portal.

## Comparison with OSC

OSC

Deploy runtime on each CSP

Add services to existing service catalog

Use CSP's internal infra and management APIs to deploy services.

Use CSP's native console.

Focuses only on public cloud providers.

XPANSE

Deploy centrally or on each CSP

Add services to xpanse catalog but can be extended to add services to CSP's catalog.

Uses available tools but can be switched to use any thing else.

Offers custom UI. But the same API can be consumed by existing cloud console. Or the custom UI can be rebranded.

Can be used for public, private clouds. Also can be used for self-service portals in enterprises/teams.



## Eclipse Xpanse Community Expansion

We wish to expand the Xpanse community and partners in all possible ways.

- > Developers to contribute to our development tasks – we have a strong and interesting product backlog.
- > Add plugins to more cloud service providers.
- > Partners who wish to use Xpanse, test and provide feedback.
- > Partners who can also support in bringing in their ideas, defining backlog and requirements.



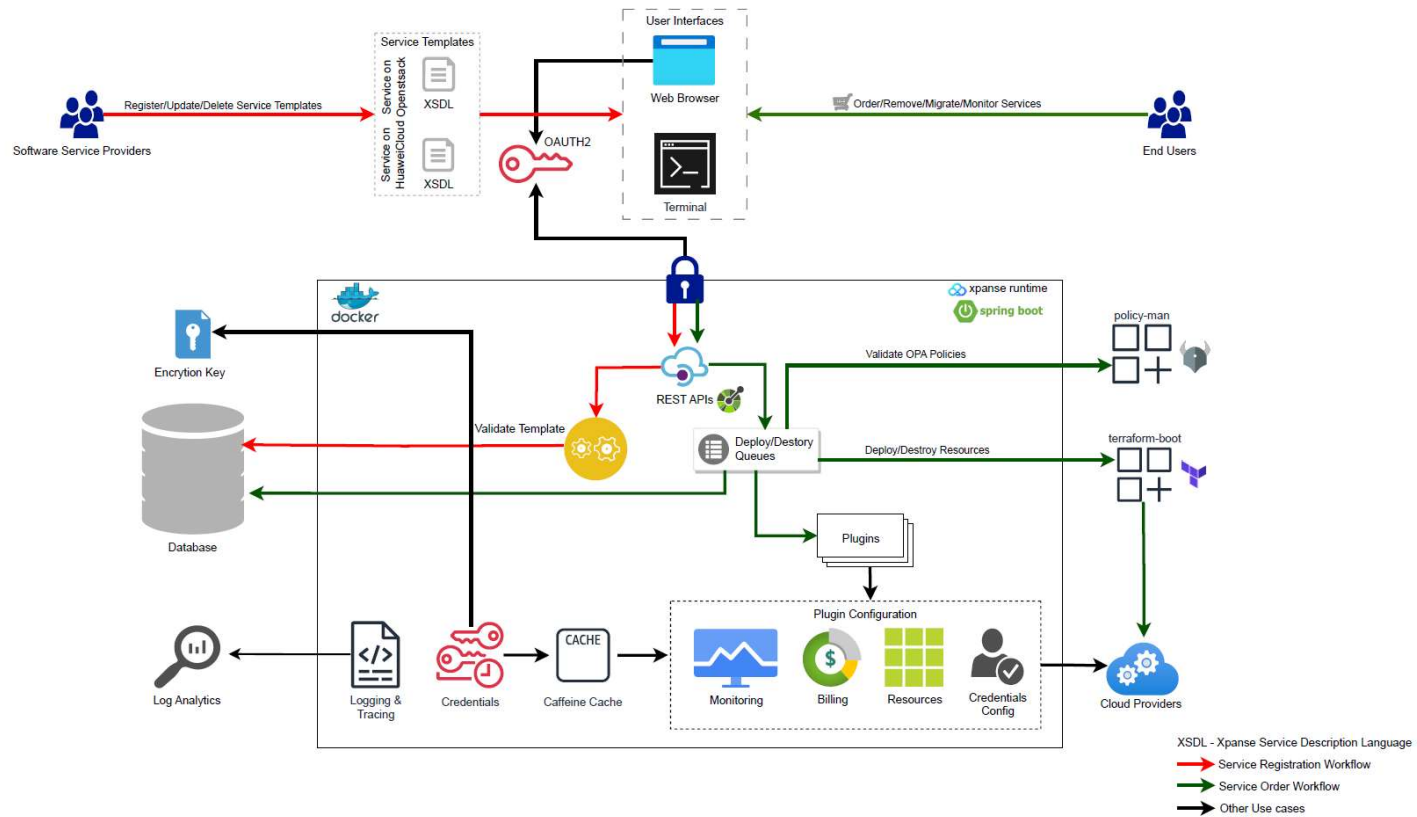
**Thank You**



## **Annex – Backup Slides**



# Eclipse Xpanse - Architecture





## Backlog

- > OPA
- > Cloud credentials from SaaS provider.
- > Move to OpenTofu as soon as it is available.
- > Extend traceability and observability.
- > K8s Operator
- > Implement light weight workflow for service migration.
- > Data portability use cases
- > Billing

# Eclipse Xpanse – Service Definition

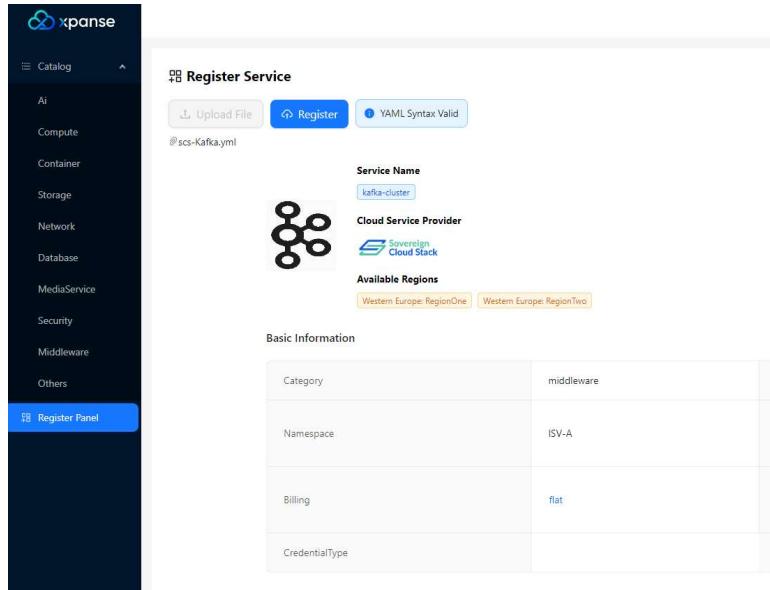
```
# The version of the OCL
version: 2.0
# The category of the service.
category: middleware
# The Service provided by the ISV, the name will be shown on the console as a service.
name: kafka-cluster
# The version of the service, if the end-user want to select the version when they want to deploy the service.
serviceVersion: v3.3.2
# For the users may have more than one service, the @namespace can be used to separate the clusters.
description: This is an enhanced Kafka cluster services by ISV-A.
namespace: ISV-A
# Icon for the service.
icon: |
  data:image/png;base64,iVBORw0KGgoAAAANSUgEUGAAAGQAAACRAQMAAAAPc4+9AAAAAXNSR0IB2cksfwAAAA1wSF1zAAAEwAACxHBAJqGAAAA
  +svLNEqBGT0ANugB0wmcGDCFOAwImGDOoqc0DtNZBdl6wx09MMT09tXPa1PqLSH30w5p81e5vltcF0t7ah5rVguqNqmMokRW4YqucVj8CBWH1:
  /z69pC057QY2z6hvJpKCHq7DRTXtG6avtuTRdbF3I3mS2H0Q1YjVbd999yK1QKw2EqShrE0k07060UPae1FlMzaaeu1KBuurHSsn572I1Kl
  /bk7Gvce/cld03ule117*12xTnPeK67mjtdppe7b030v+k5Fde3JweW53njxeGfXkaz28VeYd86+af/HBa7hgKaeBLaFzakLfyfQlTxVb
# Reserved for CSP, aws,azure,ali,huawei and ...
cloudServiceProvider:
  name: scs
  regions:
    - name: RegionOne
      area: Western Europe
    - name: RegionTwo
      area: Western Europe
billing:
  # The business model('flat', 'exponential', ...)
  model: flat
  # The rental period ('daily', 'weekly', 'monthly', 'yearly')
  period: monthly
  # The billing currency ('euro', 'usd', ...)
  currency: euro
# The flavor of the service, the @category/@name/@version/@flavor can locate the specific service to be deployed.
flavors:
  - name: 1-zookeeper-with-3-worker-nodes-normal
    # The fixed price during the period (the price applied one shot whatever is the service use)
    fixedPrice: 40
    # Properties for the service, which can be used by the deployment.
    properties:
      worker_nodes_count: 3
      flavor_name: SCS-4V:8:20
      image_name: Ubuntu 20.04
  - name: 1-zookeeper-with-3-worker-nodes-performance
    # The fixed price during the period (the price applied one shot whatever is the service use)
    fixedPrice: 60
    # Properties for the service, which can be used by the deployment.
    properties:
      worker_nodes_count: 3
      flavor_name: SCS-4V:8:20
      image_name: Ubuntu 20.04
  - name: 1-zookeeper-with-5-worker-nodes-normal
    # The fixed price during the period (the price applied one shot whatever is the service use)
    fixedPrice: 60
    # Properties for the service, which can be used by the deployment.
    properties:
      worker_nodes_count: 5
      flavor_name: SCS-4V:8:20
      image_name: Ubuntu 20.04
```

```
deployment:
  # kind, Supported values are terraform, pulumi, crossplane.
  kind: terraform
  # Context for deployment: the context including some kind of parameters for the deployment, such
  # - fix_env: Values for variable of this type are defined by the managed service provider in the
  # - fix_variable: Values for variable of this type are defined by the managed service provider i
  # - env: Value for a variable of this type can be provided by end user. If marked as mandatory t
  # can read from other sources, e.g., OS env variables). This variable is injected as a environ
  # - variable: Value for a variable of this type can be provided by end user. . If marked as mand
  # runtime (it can read from other sources, e.g., OS env variables). This variable is injected .
  # - env_env: Value to this variable is read by runtime (it can read from other sources, e.g., OS
  # - env_variable: Value to this variable is read by runtime (it can read from other sources, e.g
  # The parameters will be used to generate the API of the managed service.
  variables:
    - name: OS_AUTH_URL
      description: SCS cloud instance to be used.
      kind: fix_env
      dataType: string
      mandatory: true
      validator: length(1-256)
      sensitiveScope: none
      value: "https://api.gx-scs.sovereignit.cloud:5000/v3"
    - name: admin_passwd
      description: The admin password of all nodes in the Kafka cluster. If the value is empty, wi
      kind: variable
      dataType: string
      mandatory: false
      validator: minLength=8|maxLength=16|pattern=^(?=.*[A-Z])(?=.*[a-z])(?=.*[0-9])(?=.*[!@
      sensitiveScope: always
    - name: vpc_name
      description: The vpc name of all nodes in the Kafka cluster. If the value is empty, will use
      kind: variable
      dataType: string
      example: "kafka-vpc-default"
      mandatory: false
      value: "kafka-vpc-default"
    - name: subnet_name
      description: The sub network name of all nodes in the Kafka cluster. If the value is empty,
      kind: variable
      dataType: string
      example: "kafka-subnet-default"
      mandatory: false
      value: "kafka-subnet-default"
    - name: secgroup_name
      description: The security group name of all nodes in the Kafka cluster. If the value is empt
      kind: variable
      dataType: string
      example: "kafka-secgroup-default"
      value: "kafka-secgroup-default"
      mandatory: false
  deployer: |
    variable "flavor_name" {
      type = string
      default = "cirros256"
      description = "The flavor_name of all nodes in the Kafka cluster."
    }

    variable "image_name" {
```

# Eclipse Xpanse – UI – Service Vendor Views

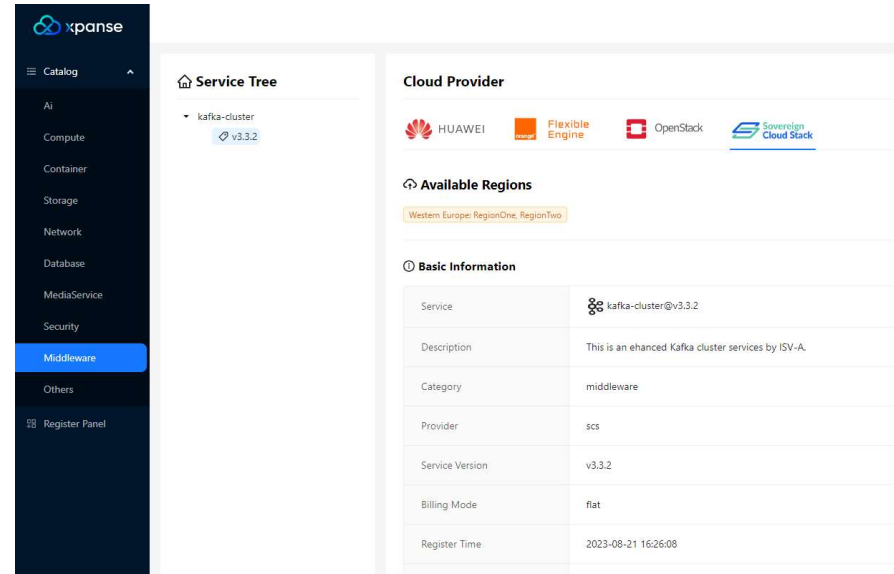
## Register New Services to catalog



The 'Register Service' UI in Eclipse Xpanse features a dark sidebar with a 'Register Panel' button. The main content area includes an 'Upload File' button, a 'Register' button, and a 'YAML Syntax Valid' status. Below this, the 'Service Name' is set to 'kafka-cluster'. The 'Cloud Service Provider' is 'Sovereign Cloud Stack'. The 'Available Regions' are 'Western Europe: RegionOne' and 'Western Europe: RegionTwo'. A 'Basic Information' table is displayed at the bottom.

Basic Information	
Category	middleware
Namespace	ISV-A
Billing	flat
CredentialType	

## Service Catalog

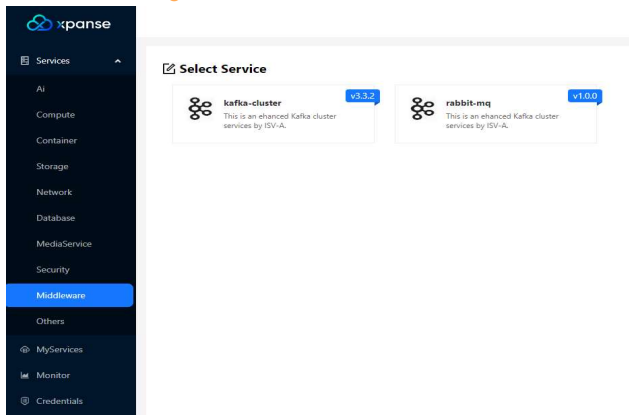


The 'Service Catalog' UI in Eclipse Xpanse shows a 'Service Tree' with 'kafka-cluster' selected. The 'Cloud Provider' section lists 'HUAWEI', 'Flexible Engine', 'OpenStack', and 'Sovereign Cloud Stack'. The 'Available Regions' are 'Western Europe: RegionOne' and 'Western Europe: RegionTwo'. The 'Basic Information' table is also present.

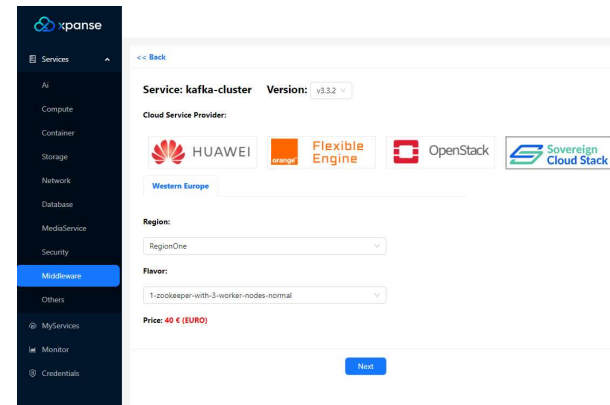
Basic Information	
Service	kafka-cluster@v3.3.2
Description	This is an enhanced Kafka cluster services by ISV-A.
Category	middleware
Provider	scs
Service Version	v3.3.2
Billing Mode	flat
Register Time	2023-08-21 16:26:08

# Eclipse Xpanse – UI – End User Views

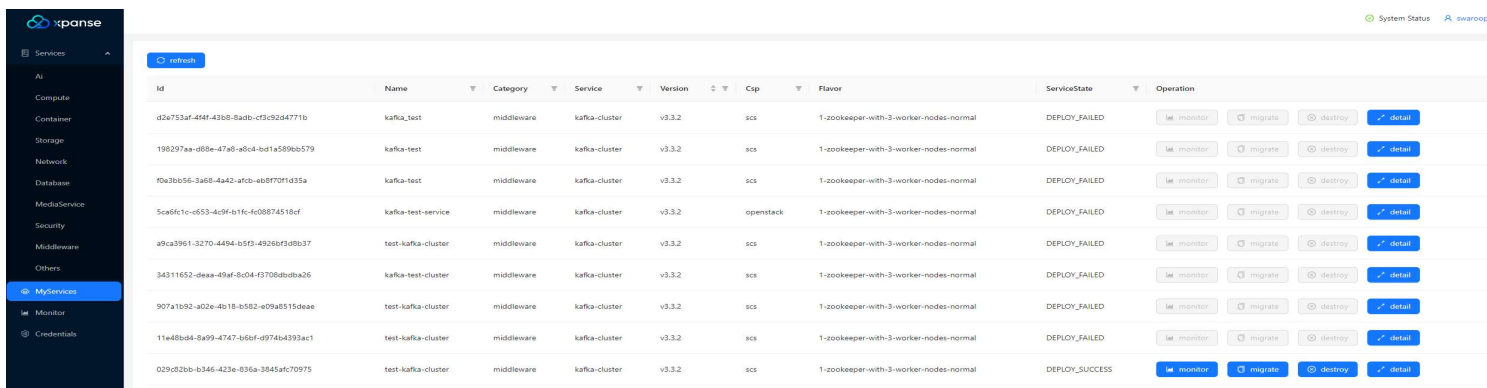
## Service Catalog



## Service Ordering



## Service Life Cycle Management





# Eclipse Xpanse – UI – End User Views

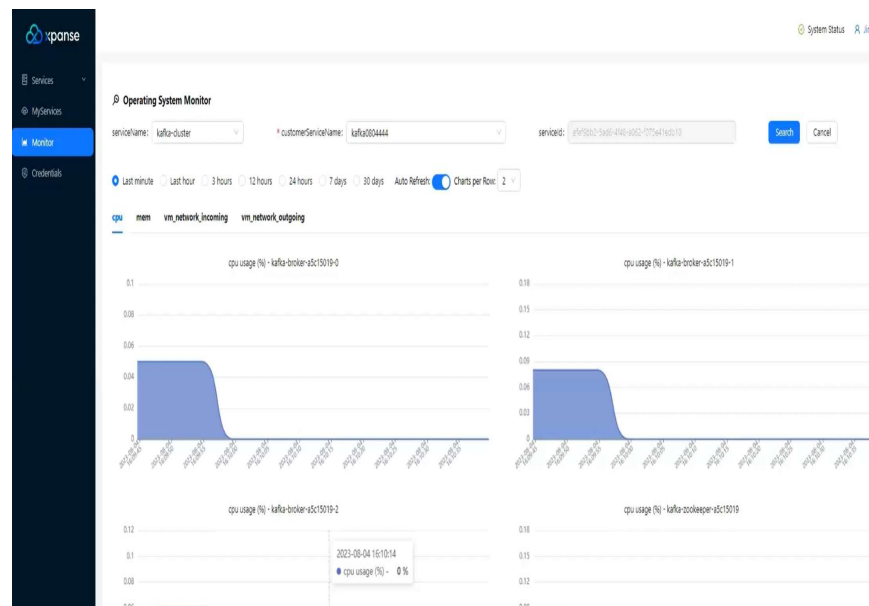
## Add CSP Credentials

The screenshot shows the 'Add Credential' dialog box in the Eclipse Xpanse UI. The dialog has a dark theme and a light background. It contains the following fields:

- Csp:** A dropdown menu with 'openstack' selected.
- Type:** A dropdown menu.
- Name:** A text input field.
- Description:** A text input field.
- Timeout (in Seconds):** A text input field.

At the bottom right of the dialog are 'Add' and 'Reset' buttons.

## Service Monitoring



## Eclipse Xpanse Stack

Xpanse stack consists of all applications required to run the complete xpanse runtime in production mode.

- > Terraform-boot – A RESTful wrapper for terraform written in Java.
- > IAM – configurations for deploying and configuring oauth providers. Currently we support Zitadel.
- > Database – We support MariaDB and can be extended other DBs as well.
- > UI – Nginx based webserver
- > Policy-man – A Restful wrapper for evaluating OPA policies written in GoLang.

Note – All components can be deployed as containers.