

# 멀티 클라우드 플랫폼을 **Kubernetes** 위에서 다루는 흥미로운 방법

송지형



cloudforet



## Table of Contents

1. **Cloudforet**
2. **오픈소스 프로젝트의 시작**
3. **Deep dive into Cloudforet**
4. **Proposal**

# Speaker

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



송지형

(bluese05@gmail.com)

현재 메가존클라우드에서 멀티클라우드 플랫폼 **SpaceONE** 백엔드 개발 리딩  
리눅스 파운데이션(LF) 정식 프로젝트 **Cloudforet** 메인테이너

KT - SK 플래닛 - 엔씨소프트 에서  
클라우드 인프라 설계 및 통합 플랫폼 개발을 담당하였습니다.

- \* *pycon 2017, 2019*
- \* *openstack day 2016*
- \* *패스트캠퍼스 강좌 및 대기업 클라우드/DevOps 강의 및 기술 자문*

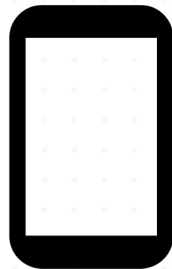
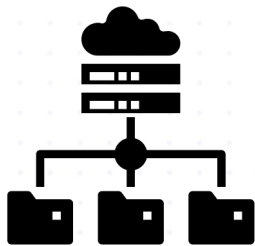
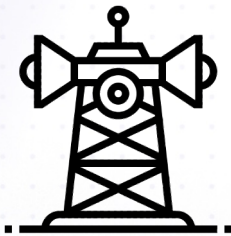
The logo for Cloudforet, featuring the word "Cloudforet" in a white, sans-serif font. The background is a dark blue gradient with a subtle grid of small dots and a large, faint, curved shape on the left side.

**Cloudforet**



# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



다양한 산업군에서 겪었던 클라우드 경험들

디테일은 다르지만, 결국 비슷한 고민

## 클라우드를 넘어

### IT 자원들을 어떻게 하면 효율적으로 관리할 수 있을까



개발

“인프라 현황”

“성능상 무리는 없는지”



운영

“인프라 자원 현황”

“장애 상황을 빠르게”



경영진

“매출 대비 인프라 비용”

“적절한 R&D 비용 측정”

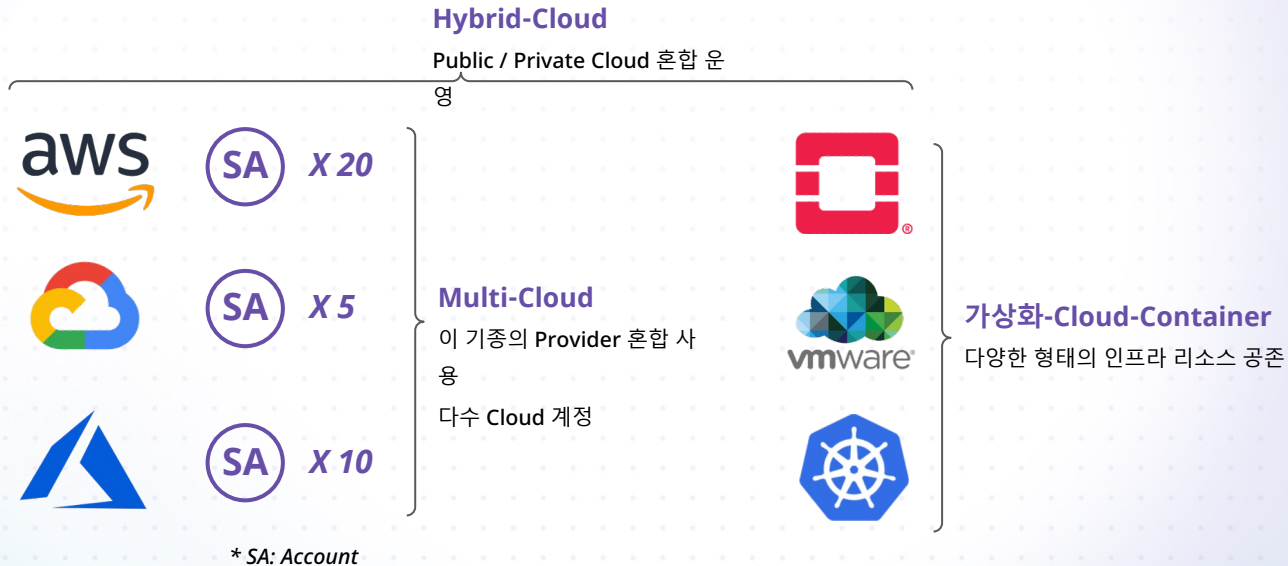


재무

“과도한 클라우드 비용”

“미래 클라우드 비용 예측”

역할에 따라 IT 자원을 바라보는 뷰와 요구사항이 다른 어려움



클라우드 사용 패턴 다양화 되고 있는 현재

다양성 vs 운영의 복잡성

이런 이슈들을 효과적으로 해결하기 위해서는..

정보의 통합

언제든 원하는 데이터에 접근

공유

이러한 목표로 개발된 프로젝트 입니다.



# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



## cloudforet

멀티 클라우드 관리 플랫폼

AWS, Azure, Google Cloud 와 같은 퍼블릭 클라우드

Openstack (프라이빗 클라우드), Kubernetes 등

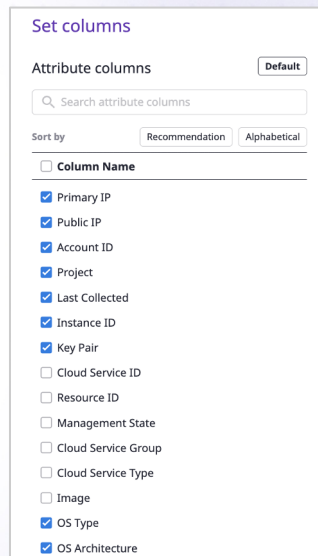
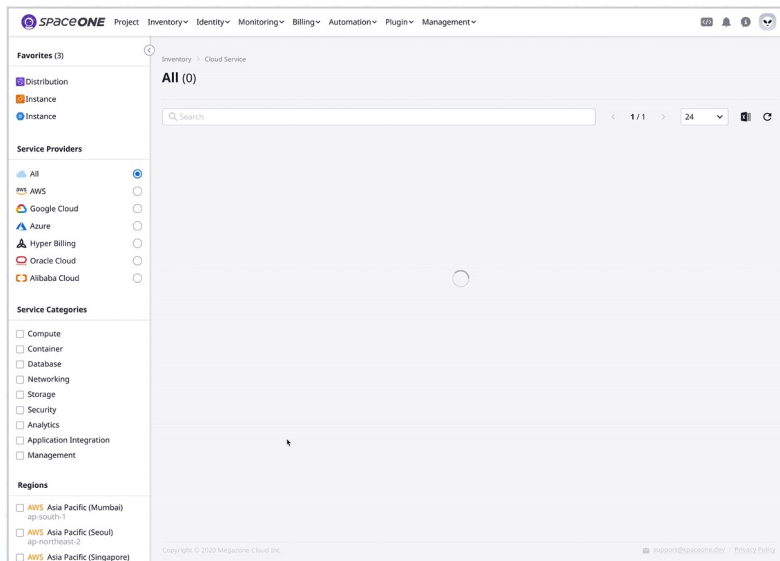
다양한 클라우드 자원의 **에셋(Asset)**, **비용**, **모니터링 이벤트** 데이터를 통합 관리 플랫폼

# Cloudforet

## Features - Inventory Assets

멀티 클라우드 멀티 계정 자원 관리  
스케줄 기반 최신 리소스 업데이트  
데이터 쿼리 지원 (Console/API)  
데이터 필드 커스터마이징  
Excel Export 연계

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



Asset Inventory > Server

Server (1 / 19)

Connect to Console

Memory: Search

Core: 2

Name	Memory	Instance Type	Core	Memory	Provider	Instance State	Availability Zone
spaceone-dev-vm1	Memory-0.5	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a
spaceone-dev-vm2	Memory-1	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a
spaceone-dev-vm3	Memory-2	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a
spaceone-dev-vm4	Memory-4	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a
spaceone-dev-vm5	Memory-8	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a
spaceone-dev-vm6	Memory-16	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a



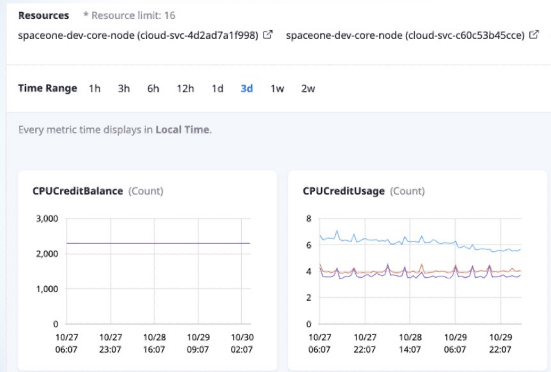
Name	Instance Type	Core	Memory	Provider	Instance State	Availability Zone	OS	Primary IP	Public IP	Account ID
spaceone-dev-vm1	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.184		5570K80816
spaceone-dev-vm2	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.113		5570K80816
spaceone-dev-vm3	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.141		5570K80816
spaceone-dev-vm4	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm5	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm6	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm7	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm8	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm9	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm10	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm11	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm12	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm13	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm14	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm15	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm16	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm17	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm18	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm19	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816
spaceone-dev-vm20	t3.xlarge	4	16 GB	AWS	Running	ap-northeast-2a	amazonlinux	172.16.18.178		5570K80816

# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Features - Inventory Assets

클라우드 리소스 모니터링  
수집 결과 기반 리소스 정보 변경 기록 저장



<input checked="" type="checkbox"/>	spaceone-dev-core-node	t3.xlarge	4
<input type="checkbox"/>	tmp-mongodb-bastion-stg-amz12	t2.xlarge	4

Details Tag Related Member **History** Monitoring

History (5)

All Month 2022 Search

2022/10/29 23:00:38	Updated 1	security_group [...]
2022/10/25 23:00:36	Updated 1	security_group [...]
2022/10/24 23:00:32	Updated 1	security_group [...]
2022/10/21 06:47:49	Updated 1	disks [...]
2022/10/13 23:00:40	Created 52	

Changes Log Note

Changes (1)

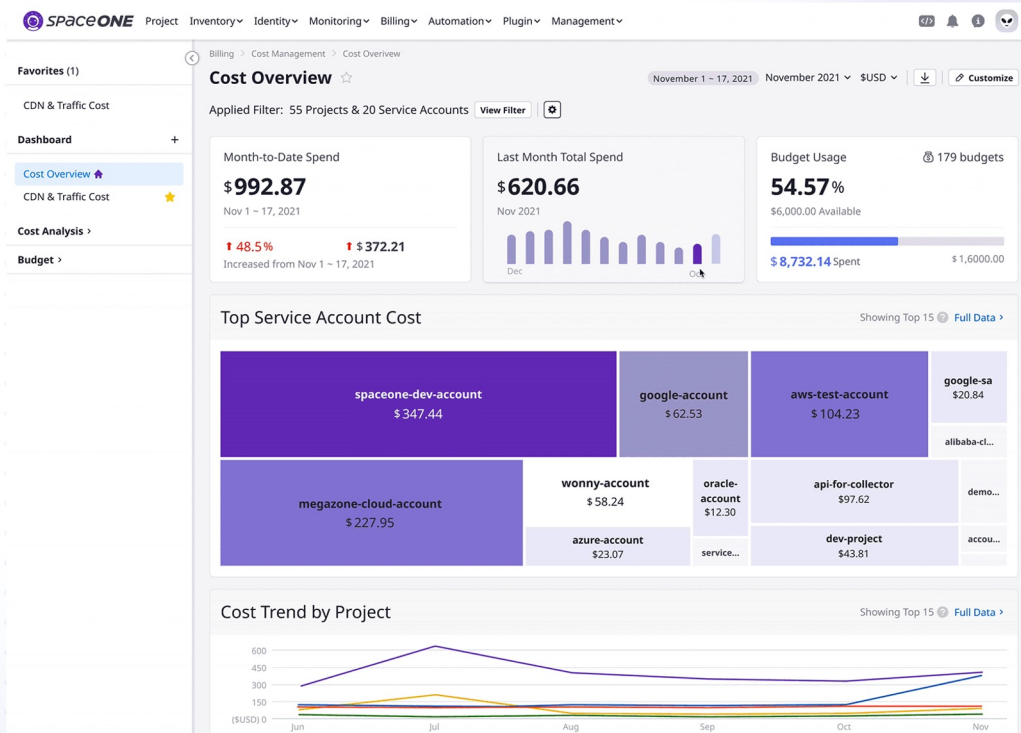
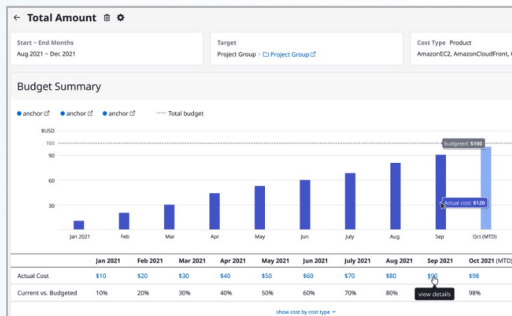
Changed Keys	data > disks
Previous	Changed
1 {	1 {
2 {	2 {
3 {	3 {
4 -	4 +
5 {	5 {
6 {	6 {
7 {	7 {
8 {	8 {
9 {	9 {
10 {	10 {
11 -	11 -
12 -	12 -
13 -	13 -
14 -	14 -
15 -	15 -
16 -	16 -
17 -	17 -
18 -	18 -
19 -	19 -
20 -	20 -
21 -	21 -
22 -	22 -
23 {	23 {
24 {	24 {
25 {	25 {
26 }	26 }

# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Features - Cost Explorer

상세 클라우드 비용 데이터 제공  
데이터 다각도 Pivot/Drilldown  
커스텀 대시보드 지원  
자원 예산 관리





# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Features - Alert Manager

통합 인시던트 관리  
다양한 종류 이벤트 수신 및 Rule 기반 Notification

**Add Webhook**

Name  
Webhook Name

Type

API Direct

AWS SNS

Docker Hub

Grafana

Jenkins

Jira

Prometheus

Terraform Cloud

Zabbix

Cancel Confirm

Alert Manager > Alert > alert-0145145385

**New image tag(1.10.3-rc3.20221028.172426) has been pushed to pyengine/console #155822**

State: Triggered Urgency: Low Assigned to: Assign Duration: 2d 18h 6m

Description: New image tag(1.10.3-rc3.20221028.172426) has been pushed to pyengine/console

Rule: --

Severity: Info

Escalation Policy: AAA

Project: プロジェクト管理プラットフォーム

Triggered By: docker

Resource Name:

Status Update: No Update New Update

Pushed Event

2022-10-28 08:35:43 [INFO] New image tag(1.10.3-rc3.20221028.172426) has been pushed to pyengine/console  
New image tag(1.10.3-rc3.20221028.172426) has been pushed to pyengine/console

Responder: [Completed]

[Step 1] LV1 Continue

[SpaceONE User] By TEXT ON  
[pyengine@pyengine] ON  
[slack] group.slack\_channel ON

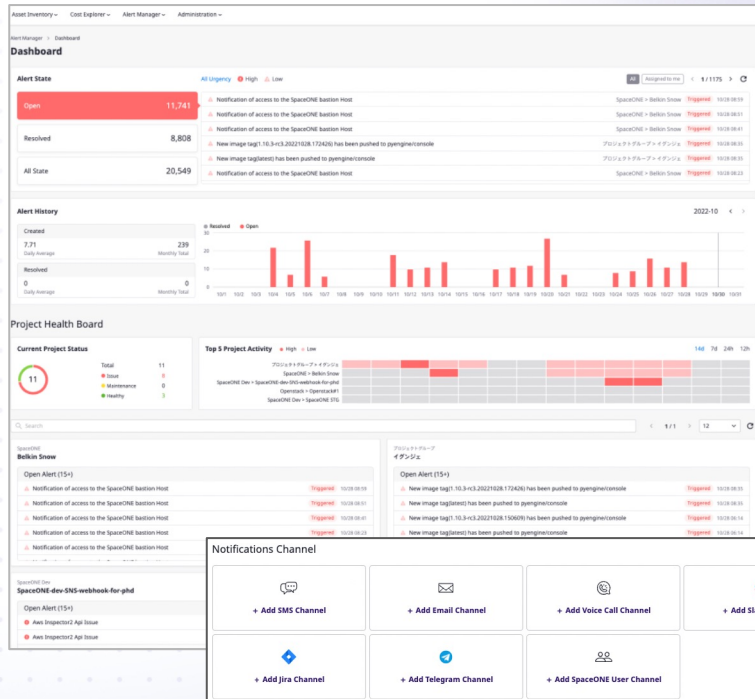
Additional Responder (0): select

Note

Add Note

Project Dependency

No Dependency



# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

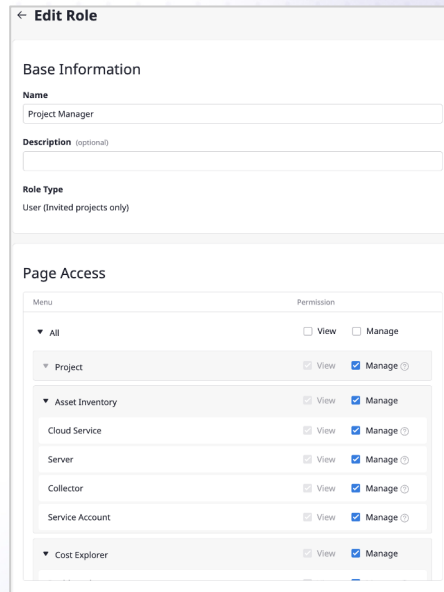
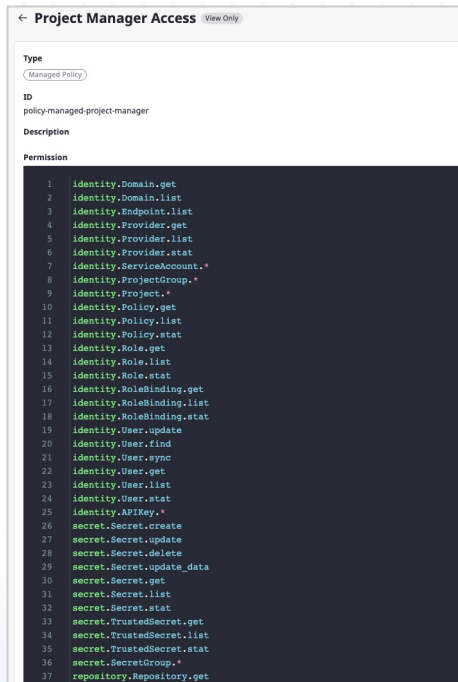
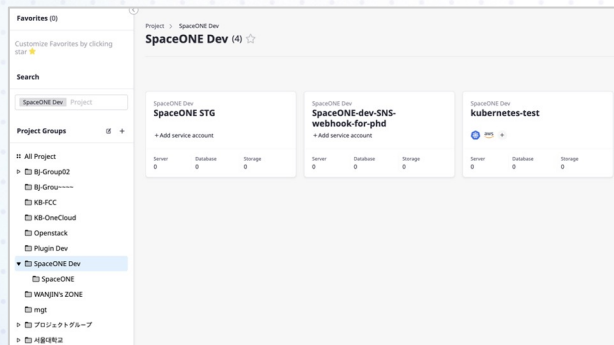
## Features - IAM

자체 RBAC 기반 API 인증/권한 처리

Domain - Project - User - Role - Policy

계층 권한 관리

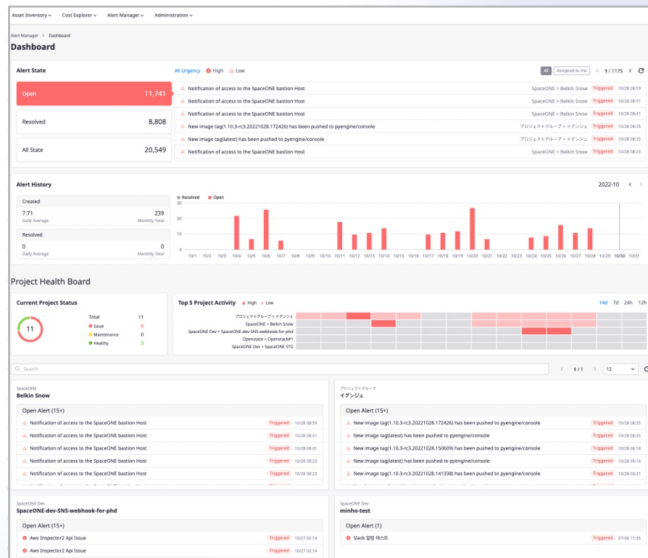
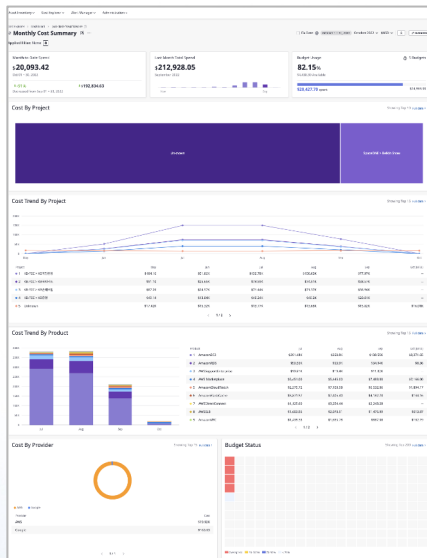
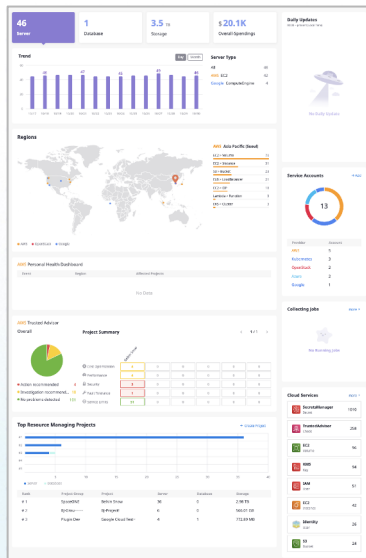
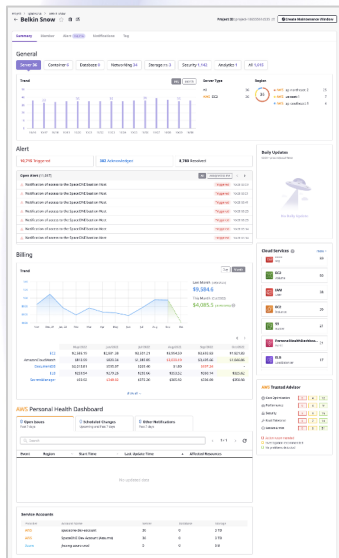
콘솔 페이지 기반 접근 제어 설정 가능



# Cloudforet

## Console & CLI & API

유려하고 사용자 친화적 UI/UX 콘솔



멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Features - Console & CLI & API

SpaceCTL : Cloudforet CLI (API Fully Supported)

Installation easily (pip)

API Key 를 활용한 CLI 권한 처리

Task 기반 CLI 작업 연계 처리 기능 (*Motivated from Ansible*)

My Page > My Account > Access with API & CLI

API Key

+ Create API Key Action

Able to create API key up to 2.

API Key ID	State	Created
<input type="radio"/> api-key-600c454619ad	Enabled	2022-07-12 04:53:03

Endpoints

Service	Name	Version	Endpoint
Inventory	Inventory Service		grpc+ssl://inventory.api.dev.spaceone.dev:443/v1
monitoring	Monitoring Service		grpc+ssl://monitoring.api.dev.spaceone.dev:443/v1
statistics	Statistics Service		grpc+ssl://statistics.api.dev.spaceone.dev:443/v1
notification	Notification Service		grpc+ssl://notification.api.dev.spaceone.dev:443/v1

```
+ spacectl list inventory.CloudServiceType --minimal
cloud_service_type_id | name | provider | group | service_code | is_primary | is_major | resource_type
-----
cloud-svc-type-7a1c113b39ff | API | AWS | APISGateway | AmazonApiGateway | True | True | inventory.CloudService
cloud-svc-type-64a0de601371 | Certificate | AWS | CertificateManager | AWSCertificateManager | True | | | inventory.CloudService
cloud-svc-type-052038879653 | Distribution | AWS | CloudFront | AmazonCloudFront | True | True | | inventory.CloudService
cloud-svc-type-0a2b193b38e3 | Trail | AWS | CloudTrail | AWSCloudTrail | True | | | inventory.CloudService
cloud-svc-type-e2c6538d1ca | Connection | AWS | DirectConnect | AWSDirectConnect | True | True | | inventory.CloudService
cloud-svc-type-83a279fde2c1 | DirectConnectGateway | AWS | DirectConnect | AWSDirectConnect | | | | inventory.CloudService
cloud-svc-type-43daF113326 | LAG | AWS | DirectConnect | AWSDirectConnect | | | | inventory.CloudService
cloud-svc-type-4dce20dadd38 | VirtualPrivateGateway | AWS | DirectConnect | AWSDirectConnect | | | | inventory.CloudService
cloud-svc-type-f346f357f99b | Cluster | AWS | DocumentDB | AmazonDocDB | True | True | | inventory.CloudService
cloud-svc-type-b46f4b654c36 | ParameterGroup | AWS | DocumentDB | AmazonDocDB | | | | inventory.CloudService
cloud-svc-type-94c313b271ae | SubnetGroup | AWS | DocumentDB | AmazonDocDB | | | | inventory.CloudService
cloud-svc-type-e5882a950490 | Table | AWS | DynamoDB | AmazonDynamoDB | True | True | | inventory.CloudService
cloud-svc-type-7659f4225c9f | AMI | AWS | EC2 | AmazonEC2 | | | | inventory.CloudService
cloud-svc-type-a33b37c988e0 | AutoScalingGroup | AWS | EC2 | AmazonEC2 | | | | inventory.CloudService
cloud-svc-type-d6dc431a9534 | EIP | AWS | EC2 | AmazonEC2 | | | True | | inventory.CloudService
cloud-svc-type-f3f90a68ec95d | Instance | AWS | EC2 | AmazonEC2 | | | True | | inventory.CloudService
cloud-svc-type-f96bf95800f3 | LaunchConfiguration | AWS | EC2 | AmazonEC2 | | | | | inventory.CloudService
cloud-svc-type-abc8772f09f1 | LaunchTemplate | AWS | EC2 | AmazonEC2 | | | | | inventory.CloudService
```

```
+ service_health_dashboard spacectl apply shd_yaml
TASK [Init Time] *****
TASK [List Cloud Service Type] *****
TASK [List Service Health Dashboard] *****
(DEBUG) =>
[]
```

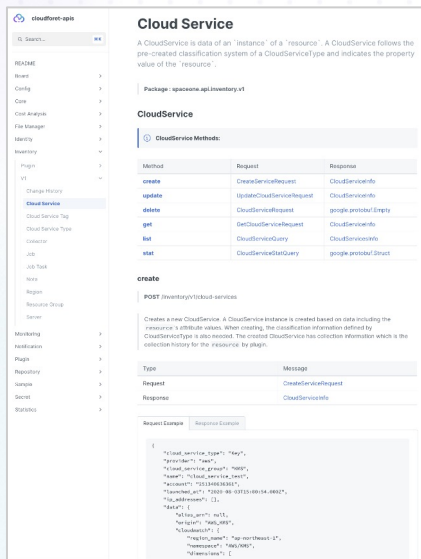


# Cloudforet

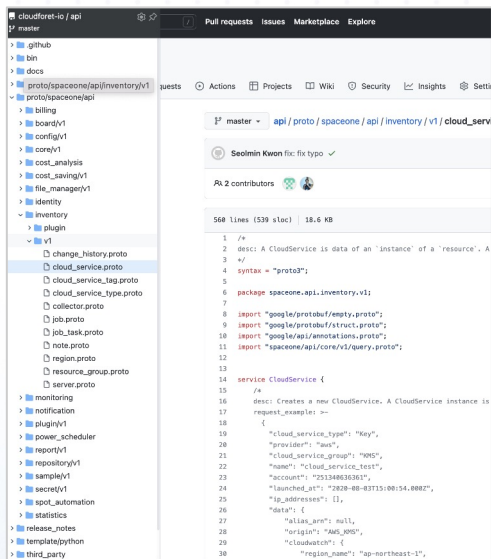
멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Features - Console & CLI & API

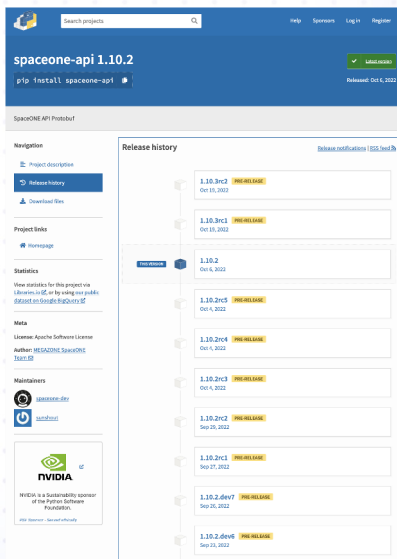
500 여개가 넘는 API 제공 (gRPC)



[ <https://cloudforet.gitbook.io/cloudforet-apis> ]



[ <https://github.com/cloudforet-io/api> ]

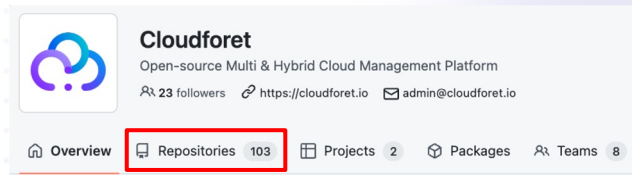
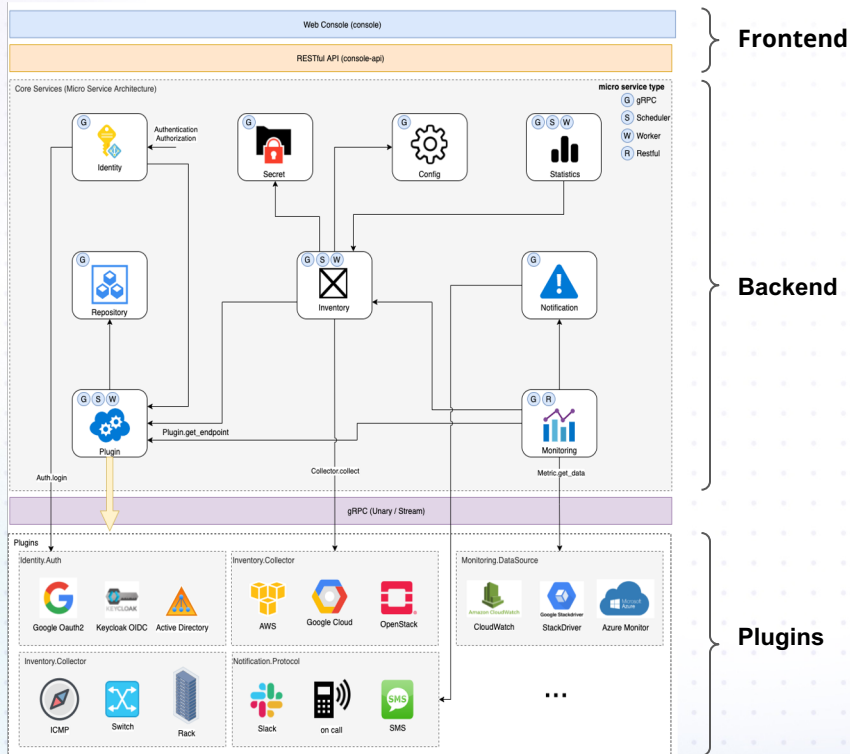


[ <https://pypi.org/search?q=spaceone-api> ]

# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Architecture



마이크로 서비스 13개 / 플러그인 50 개로 구성



***SPACEONE***

클라우드 리소스

**800K+**

서비스 어카운트

**2,000+**

빌링 데이터 Rows

**100M+**

Daily Events

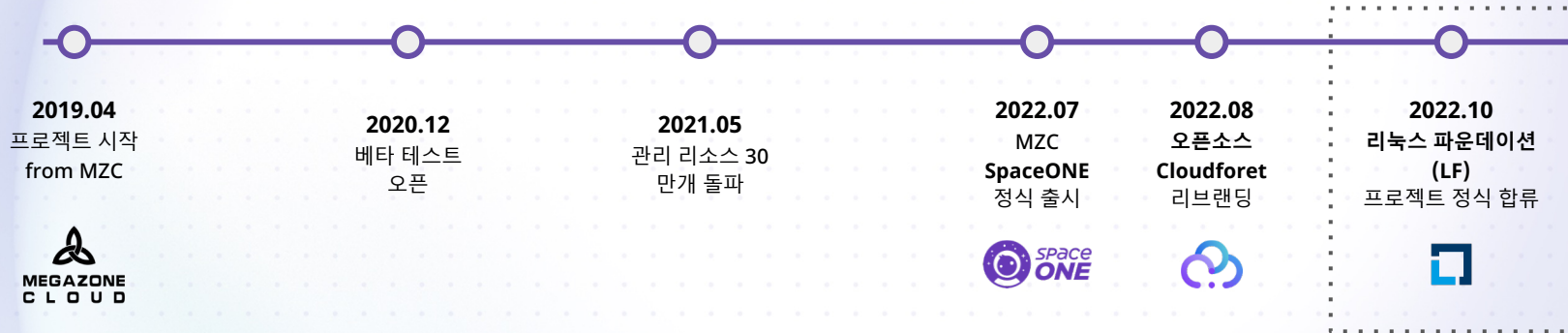
**1,000+**

# Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Footprint of Cloudforet

Cloudforet 의 여정



오픈소스 전략을 가져가는 이유



# 오픈소스 프로젝트의 시작

# 오픈소스(Oopensource) 로서의 시작

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

오픈 소스를 통해

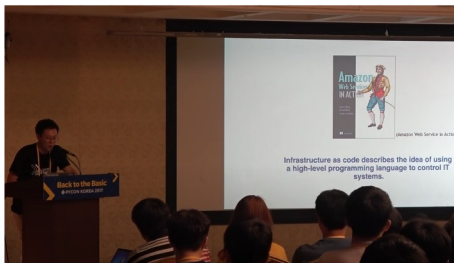
전세계 많은 엔지니어들에게 기억될 만한

클라우드 플랫폼을 만들고 싶다는

막연한 꿈과 같은 계획



2016 Openstack day



Pycon 2017



Pycon 2019

(좌절 & 그리고 다시 시도)

뒤돌아 보니

저도 참 곳곳하게 도전 했더라고요

# 오픈소스(Opensource) 로서의 시작

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

우리의 뜻을 공감해 준 회사를 만나

본격적으로 시작된 새로운 도전



# 오픈소스(Oopensource) 로서의 시작

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

어차피 시작한 이 판.. 좀 더 크게 키워볼까



Kubernetes 를 중심으로 한  
Ecosystem 형태



"SpaceONE 은 Platform Stack 에  
가깝기 때문에 방향성이 다르다는  
의견"



CNCF 상위의 리눅스 재  
단



"SpaceONE 의 명칭과 로고의 소유  
권 이슈 발생 여지가 존재"



오픈소스 프로젝트 리브랜딩



# 오픈소스(Opensource) 로서의 시작

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

2022.10월

## Linux Foundation(LF) 정식 프로젝트 (Series) 등재

### Technical Charter (the "Charter") for Cloudforet a Series of LF Projects, LLC

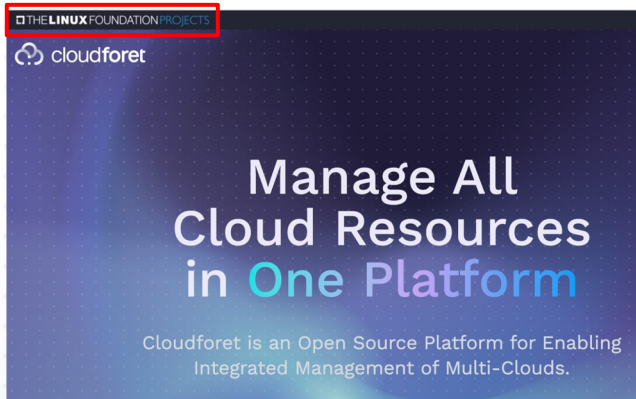
Adopted 10-7-2022

This Charter sets forth the responsibilities and procedures for technical contribution to, and oversight of, the Cloudforet open source project, which has been established as Cloudforet a Series of LF Projects, LLC (the "Project"). LF Projects, LLC ("LF Projects") is a Delaware series limited liability company. All contributors (including committers, maintainers, and other technical positions) and other participants in the Project (collectively, "Collaborators") must comply with the terms of this Charter.

#### 1. Mission and Scope of the Project

- The mission of the Project is to develop an open source multi & hybrid cloud management platform.
- The scope of the Project includes collaborative development under the Project License (as defined herein) supporting the mission, including documentation, testing, integration and the creation of other artifacts that aid the development, deployment, operation or adoption of the open source project.

Technical Charter (기술헌장)



<https://cloudforet.io>

Find a project to contribute to:

FILTER PROJECT BY

Show All

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Cicero	CICN	Civil Infrastructure Platform (CIP)	CLA Bot	CLAMP
Cloud Custodian	Cloud Events	Cloud Foundry Foundation (CF)	Cloud Hypervisor	Cloud Native Application Bundle (CNAB)
Cloud Native Computing Foundation (CNCF)	CloudEvents	Cloudforet	ClusterDuck Protocol	CNI
COBOL Programming Course	CNI-Genie	Coalition for Content Provenance and Authenticity (C2PA)	Coalition for Content Provenance and Authenticity Fund (C2PA)	Coalition for Content Provenance and Authority
	COBOL Working Group			

<https://linuxfoundation.org/projects>

# 오픈소스(Opensource) 로서의 시작

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

유저의 피드백 기준으로  
빠르게 에러를 수정해 나가고 있음

❌ <a href="#">Modify data.account_id =&gt; account in metadata</a> <a href="#">bug</a>	⬇
<small>#472 by jhyungbing was closed on 28 Aug</small>	
✅ <a href="#">Add account in match_rules</a> <a href="#">enhancement</a>	⬇
<small>#470 by jhyungbing was closed on 28 Aug</small>	
❌ <a href="#">Bug: RDS&gt;Database : Cluster object no attribute tags</a> <a href="#">bug</a>	⬇
<small>#467 by jhyungbing was closed on 2 Aug</small>	
✅ <a href="#">Add CloudWatch info for monitoring metrics</a> <a href="#">enhancement</a>	⬇
<small>#458 by jhyungbing was closed on 16 Jul</small>	
✅ <a href="#">Add CloudTrail condition data in each cloud service</a> <a href="#">enhancement</a>	⬇
<small>#453 by jhyungbing was closed on 6 Jul</small>	
✅ <a href="#">Excluding Name and Resource ID from Table and Search metadata</a> <a href="#">enhancement</a>	⬇
<small>#451 by jhyungbing was closed on 10 Jun</small>	
❌ <a href="#">An error occurred (InvalidParameterException) when calling the DescribeDBClusters operation: Unrecognized engine name: doxsh</a> <a href="#">bug</a>	⬇
<small>#447 by jhyungbing was closed on 26 May</small>	
❌ <a href="#">could not connect to the endpoint URL: "https://lightsail.eu-south-1.amazonaws.com/"</a> <a href="#">bug</a>	⬇
<small>#440 by jhyungbing was closed on 26 May</small>	
✅ <a href="#">add all storage type object size for S3</a> <a href="#">enhancement</a>	⬇
<small>#433 by jhyungbing was closed on 26 May</small>	
❌ <a href="#">Collecting Error: An error occurred (TooManyRequestsException) when calling the GetResources operation (reached max retries: 4): Too Many Requests</a> <a href="#">bug</a>	⬇
<small>#431 by jhyungbing was closed on 18 May</small>	
❌ <a href="#">Collecting Error: Could not connect to the endpoint URL: "https://lightsail.ap-east-1.amazonaws.com/"</a> <a href="#">bug</a>	⬇
<small>#430 by jhyungbing was closed on 18 May</small>	
❌ <a href="#">PostgreSQL based RDS does not worked(collected)</a> <a href="#">bug</a>	⬇
<small>#427 by jhyungbing was closed on 18 May</small>	
❌ <a href="#">Collecting Error : Not Support region (me-south-1) Lightsail</a> <a href="#">bug</a>	⬇
<small>#426 by jhyungbing was closed on 22 Apr</small>	

기업 외 다양한 단체 (ex. 대학) 연계



Community 를 통한 개발력 확보

초기 점유율 높이는데 유리

다양한 피드백 확보. 선순환 구조 가능

Global 진출 용이



실제 Openstack 연동 플러그인은  
H기업 개발자가 컨트리뷰트

Openstack Collector



version 1.0.0 License Apache 2.0

Plugin to collect Openstack

SpaceONE's [plugin-openstack-inven-collector](#) is a convenient tool to get resource data from Openstack.

Find us also at [Dockerhub](#)

Latest stable version : developing

# Deep dive into Cloudforet

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

다양한 클라우드를 품을 수 있는 구조



cloudforet

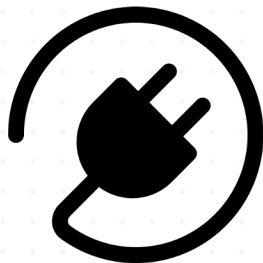
어떻게 Cloudforet 의 생태계에  
모든 클라우드를 담을 수 있을까  
구조적 고민



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

다양한 클라우드를 품을 수 있는 구조



Plugin Architecture

외부 시스템과 유기적으로 연동하기 위한 구조



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

다양한 클라우드를 품을 수 있는 구조

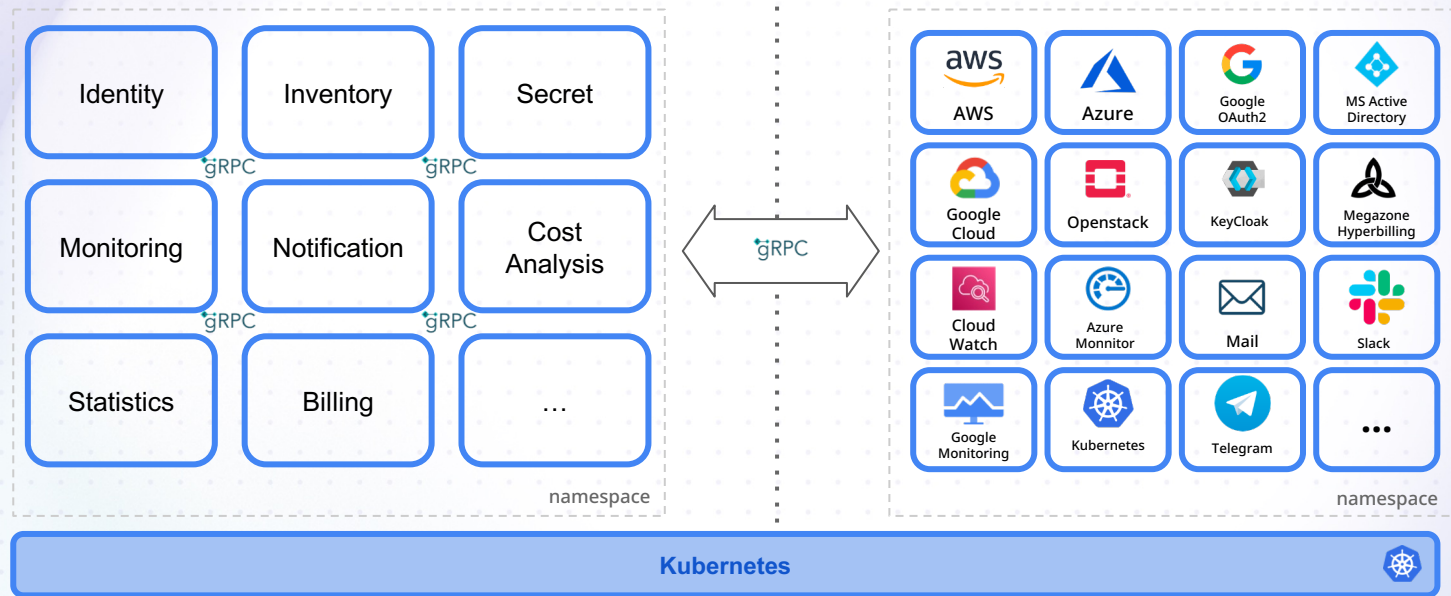


Cloud-native Plugin Architecture (CNPA)

Kubernetes 의 장점을 극대화하기로 결정

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



## Core 서비스

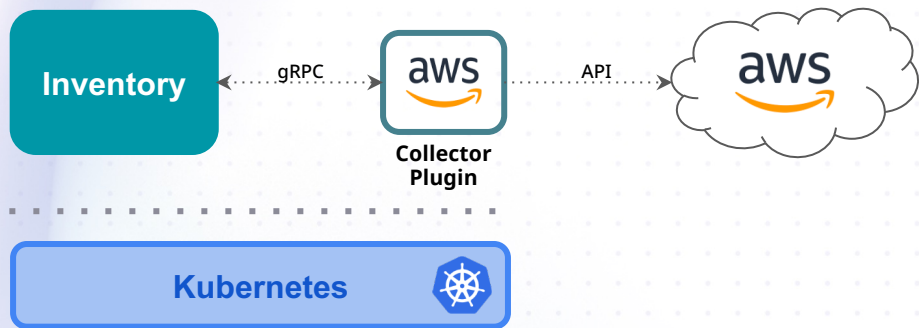
Cloudforet 기능을 담당하는 다수의 마이크로 서비스들로 구성  
개별 서비스는 모두 별도의 Pod 로 동작

## Plugin

Core 에서 정의한 기능별로 지원 영역을 확장해 나가는 역할  
Plugin 도 하나의 Pod 로 동작 cloudforet |

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

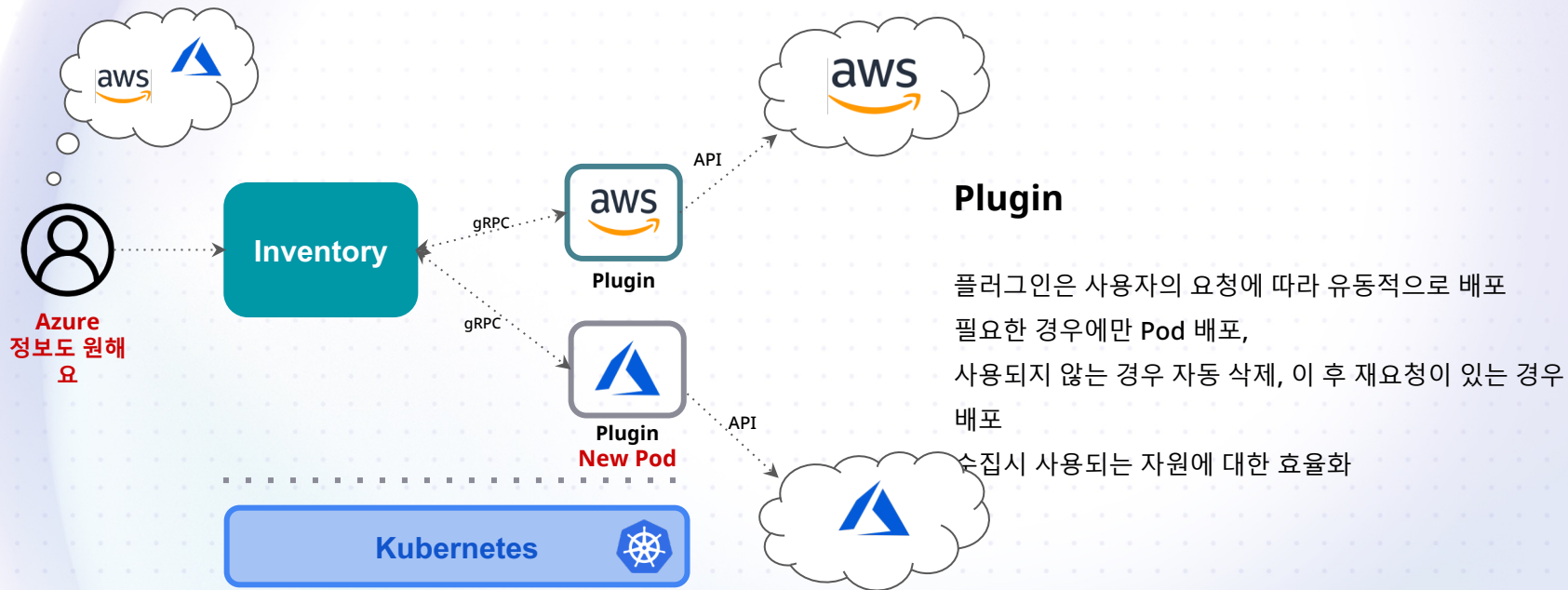


## Plugin

플러그인은 모두 Kubernetes 상의 개별 Pod 로 구성  
플러그인 도 하나의 마이크로서비스 형태  
AWS 정보를 수집하는 플러그인의 경우,  
사용자가 등록한 AWS 인증 정보에 따라  
AWS API(SDK) 를 활용해 리소스 정보 수집

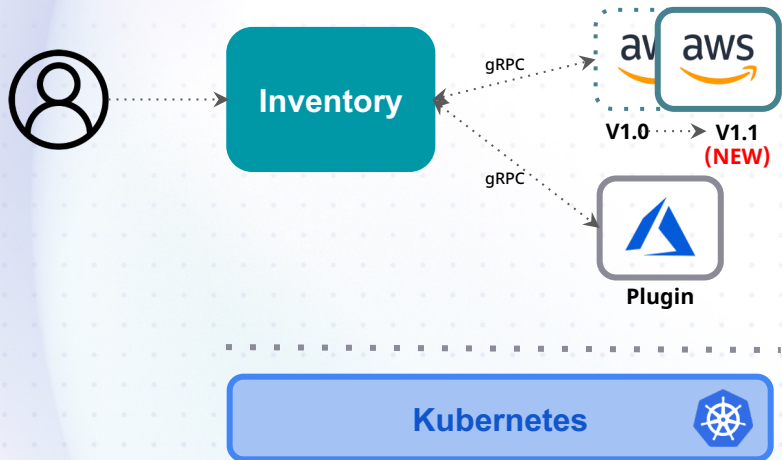
# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



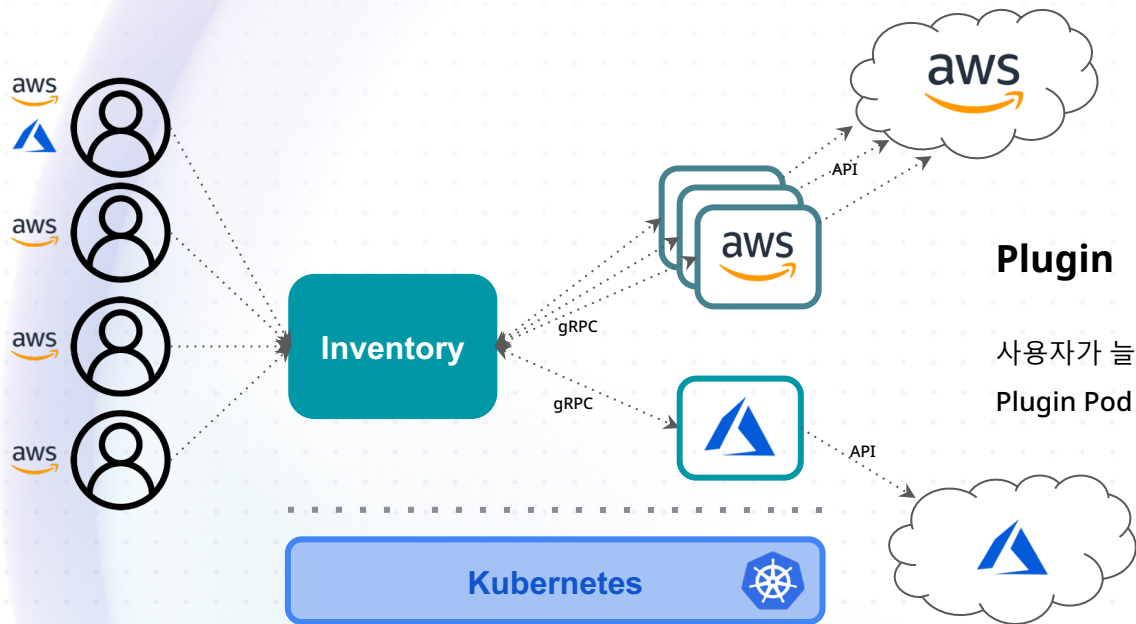
## Plugin

플러그인도 별도 Pod 이기 때문에, 언제든지 신규 업데이트 가능  
코어와 무관하게 별개의 라이프 사이클로 배포 운영



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

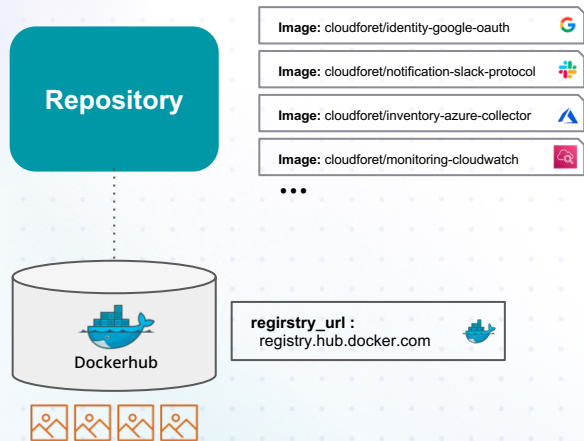


## Plugin

사용자가 늘어나, AWS 리소스 정보 수집 요청수가 많아지면,  
Plugin Pod 를 확장하여 동적으로 Scaling-out 하는 형태

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

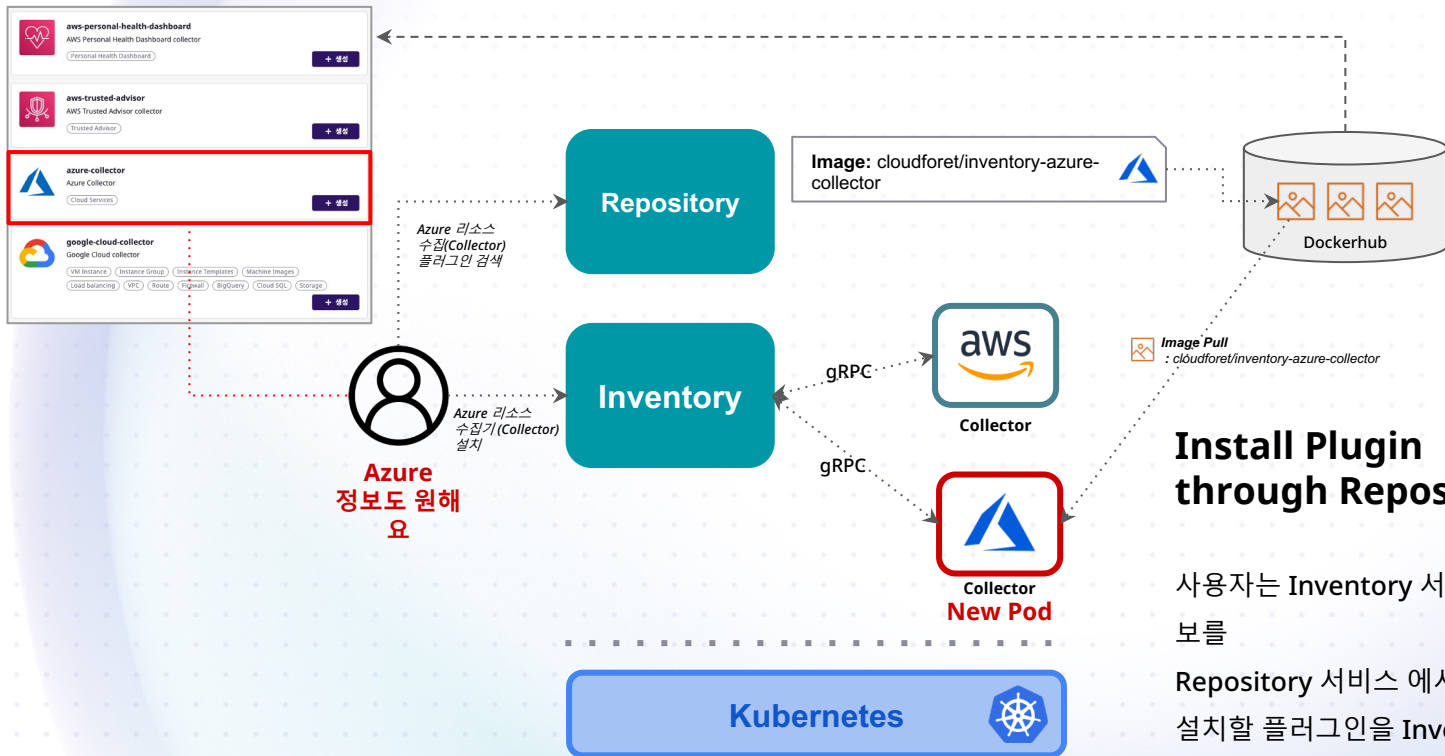


## Repository

배포 가능한 플러그인 정보들을 관리하는 마이크로 서비스 플러그인들은 모두 컨테이너들이기 때문에 플러그인들의 컨테이너 이미지와 **Registry URL** 정보를 관리

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



## Install Plugin through Repository

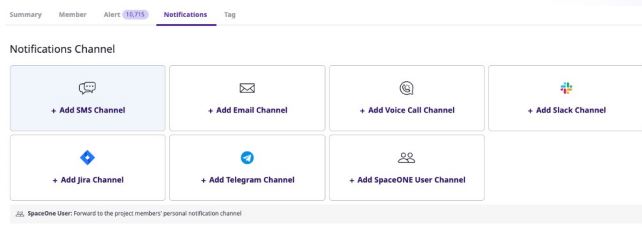
사용자는 Inventory 서비스에 설치 가능한 플러그인 정보를

Repository 서비스에서 검색

설치할 플러그인을 Inventory 서비스의 Collector로 배포

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



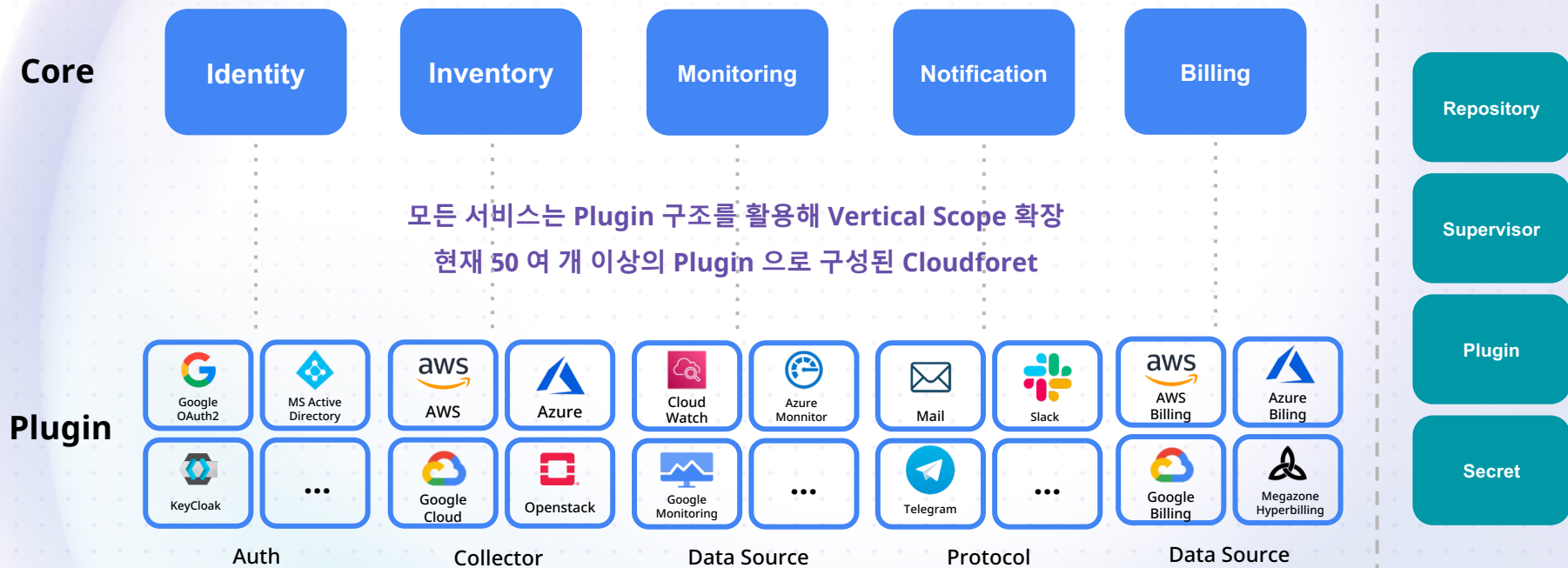
Cloudforet Console 적용

## Repository 구조의 장점

- 누구나 플러그인을 제작 후 등록 가능한 구조
- 코어와 무관하게 운영
- 오픈소스 커뮤니티 활성화
- 3rd Party 참여 유도
- 기업 적용시 커스터마이징 용이

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법





# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

```
1 {
2   "ip_addresses": [],
3   "cloud_service_id": "cloud-svc-7ce377f5c655",
4   "name": "spaceone-dev-grpc-alb",
5   "state": "ACTIVE",
6   "account": "257706363616",
7   "instance_type": "Application",
8   "instance_size": 0,
9   "cloud_service_type": "LoadBalancer",
10  "cloud_service_group": "ELB",
11  "provider": "aws",
12  "data": {
13    "target_groups": {[]},
14    "security_groups": {[]},
15    "type": "application",
16    "scheme": "internet-facing",
17    "created_time": "2022-08-09T08:47:52.740000+0000",
18    "state": {[]},
19    "cloudtrail": {[]},
20    "tags": {[]},
21    "canonical_hosted_zone_id": "ZWKPGT148KDX",
22    "cloudwatch": {[]},
23    "instances": {[]},
24    "dns_name": "spaceone-dev-grpc-alb-2035840108.ap-northeast-2.elb.amazonaws.com",
25    "attributes": {[]},
26    "load_balancer_arn": "arn:aws:elasticloadbalancing:ap-northeast-2:257706363616:loadbalancer/vpc/vpc-04959981070aa0c727",
27    "ip_address_type": "ipv4",
28    "availability_zones": {[]},
29    "listeners": {[]},
30    "load_balancer_name": "spaceone-dev-grpc-alb"
31  },
32  "metadata": {[]},
33  "reference": {[]},
34  "tags": {[]},
35  "collection_info": {[]},
36  "region_code": "ap-northeast-2",
37  "project_id": "project-18655561c535",
38  "domain_id": "domain-38010aa2e451",
39  "created_at": "2022-09-30T02:07:48.514Z",
40  "updated_at": "2022-10-31T02:08:43.584Z",
41  "deleted_at": ""
42 }
```

AWS ELB LoadBalancer 21

```
1 {
2   "ip_addresses": [],
3   "cloud_service_id": "cloud-svc-bc9968ecf71a",
4   "name": "minho-rg-vent",
5   "state": "ACTIVE",
6   "account": "3ec64e1e-1ce8-4f2c-82a0-a7f6db0899ca",
7   "instance_type": "",
8   "instance_size": 0,
9   "cloud_service_type": "Instance",
10  "cloud_service_group": "VirtualNetworks",
11  "provider": "azure",
12  "data": {
13    "id": "/subscriptions/3ec64e1e-1ce8-4f2c-82a0-a7f6db0899ca/resourceGroups/minho-rg/providers/Microsoft.Networks/virtualNetworks/minho-rg-vent",
14    "enable_ddos_protection": false,
15    "private_endpoints": {[]},
16    "resource_group": "minho-rg",
17    "subscription_name": "CloudONE Development",
18    "azure_monitor": {[]},
19    "etag": "W/\"011dae06-e541-4833-8f4c-1fe6415bb96b\"",
20    "subscription_id": "3ec64e1e-1ce8-4f2c-82a0-a7f6db0899ca",
21    "type": "Microsoft.Network/virtualNetworks",
22    "name": "minho-rg-vent",
23    "subnets": {[]},
24    "dhcp_options": {[]},
25    "address_space": {[]},
26    "provisioning_state": "Succeeded",
27    "location": "uksouth",
28    "connected_devices": {[]},
29    "resource_guid": "01f10aed-9528-488b-9928-3bd2a4b34be"
30  },
31  "metadata": {[]},
32  "reference": {[]},
33  "tags": {[]},
34  "collection_info": {[]},
35  "region_code": "uksouth",
36  "project_id": "project-5650877dbaf",
37  "domain_id": "domain-495e098e37e0",
38  "created_at": "2022-10-28T13:52:56",
39  "updated_at": "2022-10-31T18:04:13",
40  "deleted_at": ""
41 }
```

Azure VirtualNetworks Instance 3

```
1 {
2   "ip_addresses": [],
3   "cloud_service_id": "cloud-svc-6d7c73bc5cf8",
4   "name": "projects/bluese-cloudone-20200113/topics/duration-test3",
5   "state": "ACTIVE",
6   "account": "bluese-cloudone-20200113",
7   "instance_type": "",
8   "instance_size": 0,
9   "cloud_service_type": "Topic",
10  "cloud_service_group": "Pub/Sub",
11  "provider": "google_cloud",
12  "data": {
13    "topic_id": "duration-test3",
14    "project": "bluese-cloudone-20200113",
15    "display": {[]},
16    "message_retention_duration": "600s",
17    "name": "projects/bluese-cloudone-20200113/topics/duration-test3",
18    "subscriptions": {[]},
19  },
20  "metadata": {[]},
21  "reference": {[]},
22  "tags": {[]},
23  "collection_info": {[]},
24  "region_code": "Global",
25  "project_id": "project-5650877dbaf",
26  "domain_id": "domain-d95",
27  "created_at": "2022-10-2",
28  "updated_at": "2022-10-3",
29  "deleted_at": ""
30 }
```

Google Pub/Sub Schema 1 Subscription 11

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

Azure  
VirtualNetworks

Instance 3

Google  
Pub/Sub

Schema 1

Subscription 11

AWS  
ELB

LoadBalancer 21

OpenStack  
Compute

Hypervisor 2

NEW

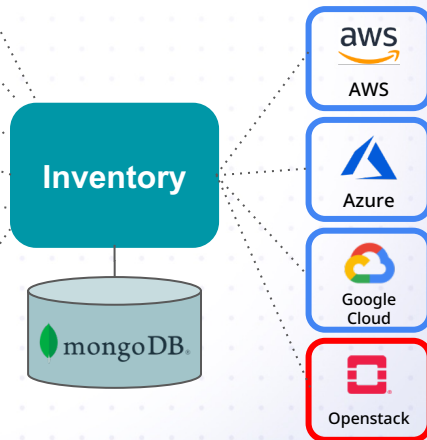


<input type="checkbox"/>	Name	Resource Group	Location	Subscription Name	Provider
<input type="checkbox"/>	minho-rg-vent	minho-rg	uksouth	CloudONE Development	Azure
<input type="checkbox"/>	seolmin-rg-vnet	seolmin-rg	koreacentral	CloudONE Development	Azure
<input type="checkbox"/>	jhsong-rg-vnet	jhsong-rg	eastus	CloudONE Development	Azure

<input type="checkbox"/>	Name	Encryption key	Topic ID	Retention	Subscription count	Project	Provider
<input type="checkbox"/>	projects/bluese-cloudone-20200113/topics/duration-test3	Google managed	duration-test3	10 min	1	bluese-cloudone-20200113	Google
<input type="checkbox"/>	projects/bluese-cloudone-20200113/topics/duration-test	Google managed	duration-test	3 days 18 hr	1	bluese-cloudone-20200113	Google
<input type="checkbox"/>	projects/bluese-cloudone-20200113/topics/topic-test	Google managed	topic-test	7 days	1	bluese-cloudone-20200113	Google
<input type="checkbox"/>	projects/bluese-cloudone-20200113/topics/seolmin-dev-test	Google managed	seolmin-dev-test		6	bluese-cloudone-20200113	Google
<input type="checkbox"/>	projects/bluese-cloudone-20200113/topics/test	Google managed	test		1	bluese-cloudone-20200113	Google

<input type="checkbox"/>	Name	DNS Name	State	Type	Availability Zones	Provider
<input type="checkbox"/>	spaceone-dev-grpc-alb	spaceone-dev-grpc-alb-2035840108.ap-northeast-2.elb.amazonaws.com	active	application	ap-northeast-2c ap-northeast-2b ap-northeast-2a	AWS
<input type="checkbox"/>	cloudforet-io-alb	cloudforet-io-alb-1367026454.ap-northeast-2.elb.amazonaws.com	active	application	ap-northeast-2c ap-northeast-2b ap-northeast-2a	AWS
<input type="checkbox"/>	samsung-poc-rancher-alb	samsung-poc-rancher-alb-1064063985.ap-northeast-2.elb.amazonaws.com	active	application	ap-northeast-2c ap-northeast-2b ap-northeast-2a	AWS
<input type="checkbox"/>	service-portal-api-rest-dev-alb	service-portal-api-rest-dev-alb-784627884.ap-northeast-2.elb.amazonaws.com	active	application	ap-northeast-2c ap-northeast-2b ap-northeast-2a	AWS
<input type="checkbox"/>	service-portal-dev-grpc	service-portal-dev-grpc-1863174323.ap-northeast-2.elb.amazonaws.com	active	application	ap-northeast-2c ap-northeast-2b ap-northeast-2a	AWS

<input type="checkbox"/>	Name	Instances Count	State	Status	IP Address	Type	Availability Zone	Provider	Region
<input type="checkbox"/>	ip-172-31-35-220	8	UP	ENABLED	172.31.35.220	QEMU	nova	OpenStack	Seongnam   RegionOne
<input type="checkbox"/>	openstack-1	4	UP	ENABLED	172.31.36.199	QEMU	nova	OpenStack	Seongnam   RegionOne



Frontend(;;)

cloudforet

THE LINUX FOUNDATION

# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Dynamic Layout

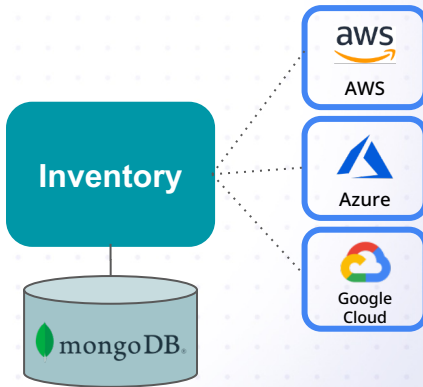
<input type="checkbox"/>	Name	Instance State	Instance Type
<input type="checkbox"/>	spaceone-dev-supervisor-node	● RUNNING	t3.xlarge
<input type="checkbox"/>	spaceone-dev-supervisor-node	● RUNNING	t3.xlarge
<input type="checkbox"/>	windowsManager_test	● STOPPED	t2.micro
<input type="checkbox"/>	cloudforet-cloudwatch-test	● STOPPED	t2.micro
<input type="checkbox"/>	spaceone-dev-core-node	● RUNNING	t3.xlarge

Details		Tags	Member	History	Monitoring
Base Information		AWS EC2	AWS Tags	Disk	NIC
Security					
EC2 Instance					
Instance ID	i-0a1ef8ff762b11399				
Instance State	● RUNNING				
Instance Type	c5.large				
EC2 Lifecycle	scheduled				
Key Pair	cloudone-dev-v1-kubectl-ec2-key				
IAM Role ARN					



### JSON-based View Metadata

```
{
  "view": {
    "sub_data": {
      "layouts": [
        {
          "type": "list",
          "options": {
            "layouts": [
              {
                "name": "EC2 Instance",
                "options": {
                  "fields": [
                    {
                      "type": "text",
                      "key": "data.compute.instance_id",
                      "name": "Instance ID"
                    },
                    {
                      "name": "Instance State",
                      "type": "enum",
                      "options": {
                        "key": "data.compute.instance_state"
                      }
                    }
                  ]
                }
              }
            ]
          }
        }
      ]
    }
  }
}
```





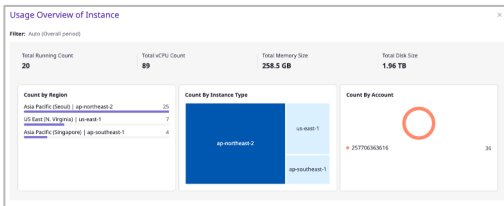
# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

## Dynamic Layout

Name	Instance State	Instance Type	Core	Memory	Availability Zone	OS	Primary IP	Account ID	Provider
spaceone-dev-superior-node	RUNNING	t3.xlarge	4	16	ap-northeast-2a	amazonlinux		257706363616	aws
spaceone-dev-superior-node	RUNNING	t3.xlarge	4	16	ap-northeast-2c	amazonlinux		257706363616	aws
windowsManager_test	STOPPED	t2.micro	1	1	us-east-1a	windows		257706363616	aws
cloudforet-cloudwatch-test	STOPPED	t2.micro	1	1	us-east-1a	amazonlinux		257706363616	aws
spaceone-dev-core-node	RUNNING	t3.xlarge	4	16	ap-northeast-2c	amazonlinux		257706363616	aws
spaceone-dev-core-node	RUNNING	t3.xlarge	4	16	ap-northeast-2a	amazonlinux		257706363616	aws
spaceone-dev-core-node	RUNNING	t3.xlarge	4	16	ap-northeast-2c	amazonlinux		257706363616	aws
	RUNNING	t3.medium	2	4	us-east-1a	amazonlinux		257706363616	aws
	RUNNING	t3.medium	2	4	us-east-1f	amazonlinux		257706363616	aws
	RUNNING	t3.medium	2	4	us-east-1b	amazonlinux		257706363616	aws
spaceone-dev-ghi-deployed-node	RUNNING	t3.xlarge	4	16	ap-northeast-2a	amazonlinux		257706363616	aws
spaceone-subnet	active	subnet	1	1	ap-northeast-2a	amazonlinux	192.168.0.1/24	257706363616	aws

Cloud Service Table



Dynamic Widget

Base Information	AWS EC2	Disk	NIC	Security Groups	ELB	Raw Data
EC2 Instance						
Instance ID	i-014a73ee9326400a3 ⓘ					
Instance State	RUNNING ⓘ					
Instance Type	t3.xlarge ⓘ					
EC2 Lifecycle	spot ⓘ					
Key Pair	cloudone-dev-v1-eks-worker-node-key ⓘ					
IAM Role ARN	arn:aws:iam::257706363616:instance-profile/eks-d4c1e813-33a4-a1a1-f20f-c5fa50e8913d ⓘ					
EBS-Optimized	false ⓘ					
AMI ID	amazon-eks-node-1.21-v20220926 ⓘ					
Region	ap-northeast-2 ⓘ					
Availability Zone	ap-northeast-2a ⓘ					
Termination Protection	false ⓘ					
Public DNS						
Public IP						
Security Groups	template-0502-remoteAccess-add (sg-0ad036760aaecd21) ⓘ eks-cluster-sg-cloudone-dev-v1-eks-cluster-455409756 (sg-082279a40c912840c) ⓘ ⓘ					
Account ID	257706363616 ⓘ					

Detail Item

← Instance (1 / 36)	
Connect to Console	Search
Usage Overview	
Total Running Count: 20	
<input type="checkbox"/>	Name
<input checked="" type="checkbox"/>	spaceone-dev-supe
<input type="checkbox"/>	spaceone-dev-supe
<input type="checkbox"/>	windowsManager_t
<input type="checkbox"/>	cloudforet-cloudwa
<input type="checkbox"/>	spaceone-dev-core
	Availability Zone

Search  
(Auto Complete)

Definition	
<pre>1 { 2   "type": "record", 3   "name": "Avro", 4   "fields": [ 5     { 6       "name": "StringField", 7       "type": "string", 8     }, 9     { 10      "name": "IntField", 11      "type": "int", 12    } 13   ] 14 }</pre>	
Close	

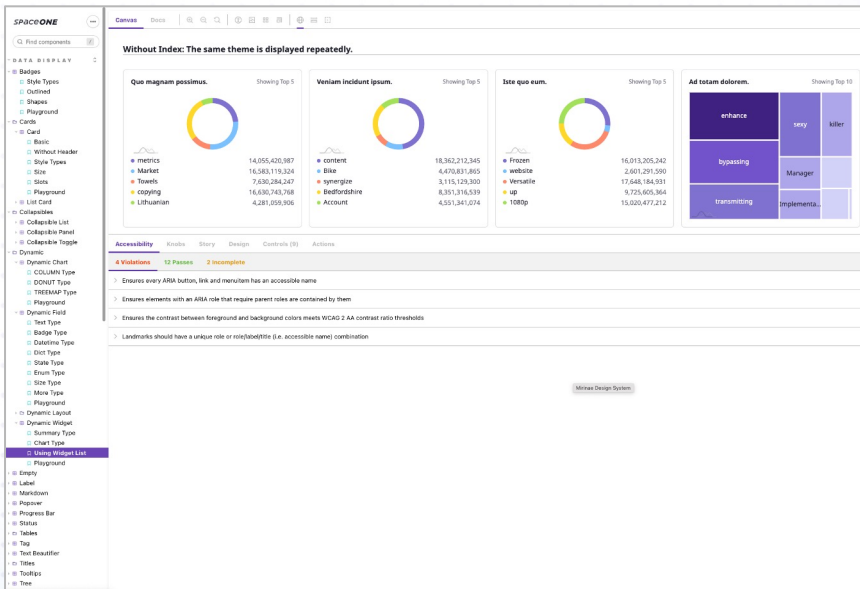
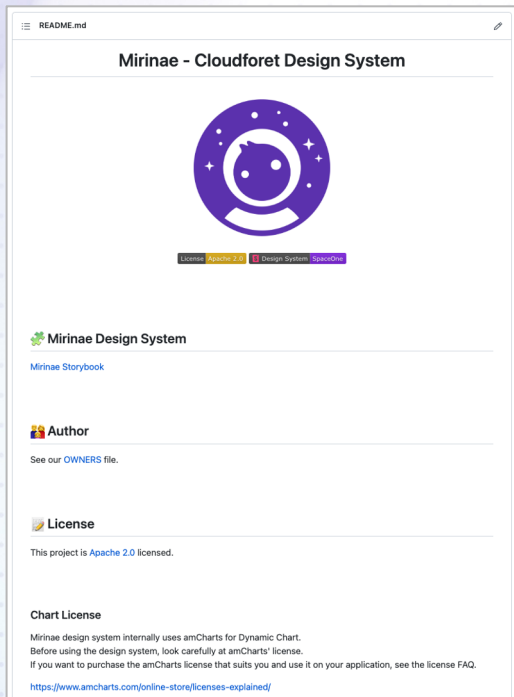
Raw data



# Deep dive into Cloudforet

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법

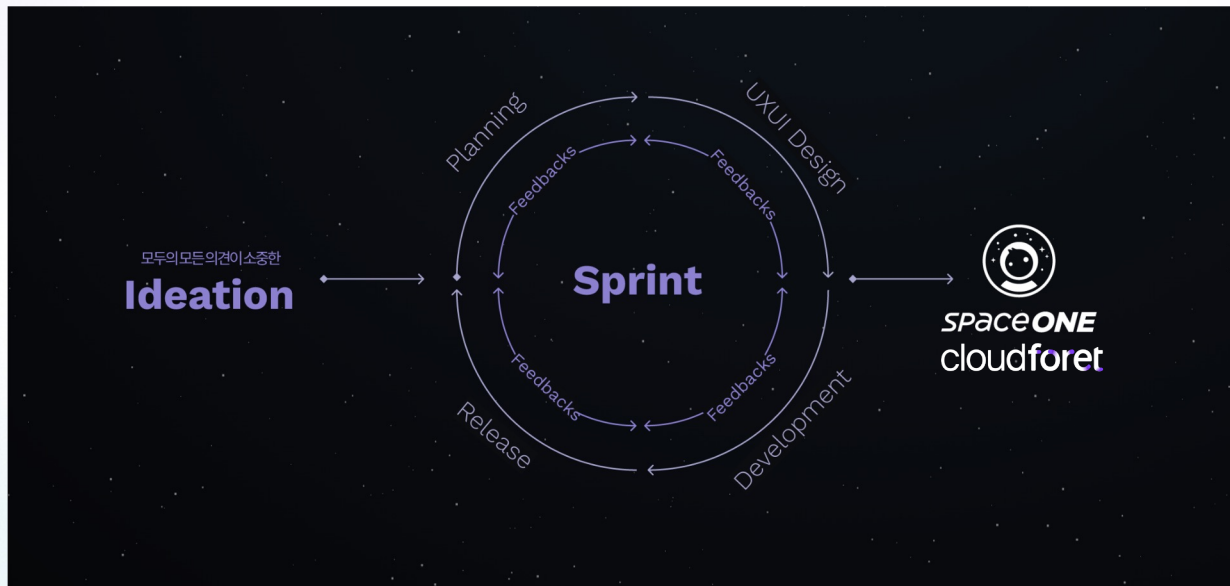
## Design System (Mirinae)



# Proposal

# Proposal

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



# Proposal

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



***We are Hiring !***

***admin@cloudforet.io (admin)***

***bluese05@gmail.com (송지형)***

**Backend Developer**

**Frontend Developer**

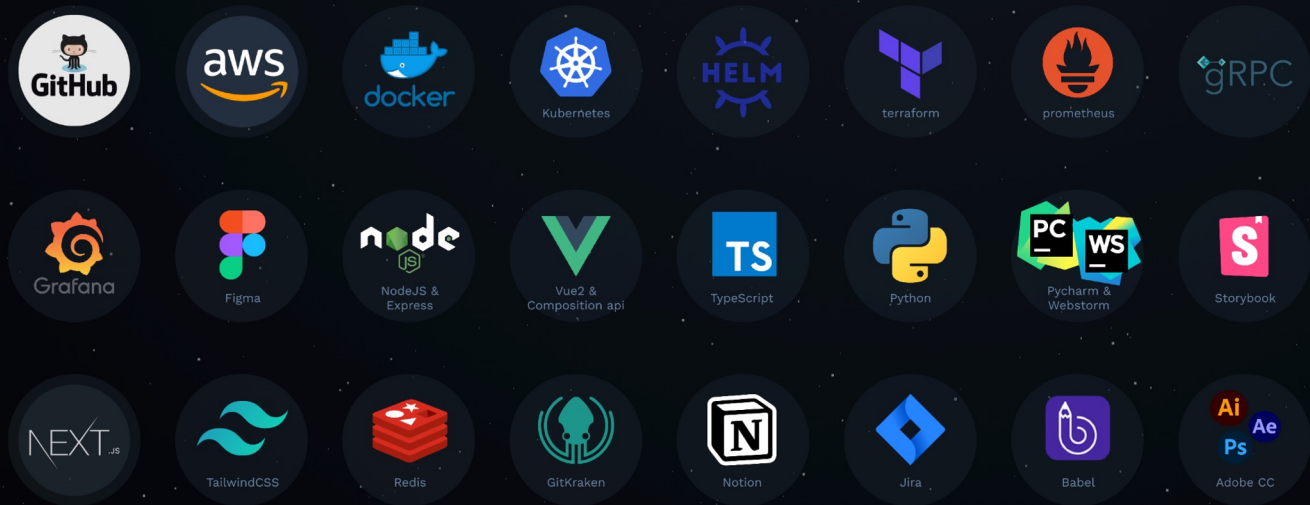
**Security Developer**

**SRE (Site Reliability Engineering)**

# Proposal

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법


이런 기술 & 도구로 만들고 있어요





# Contact

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



cloudforet

Menu

## Manage All Cloud Resources in One Platform

Cloudforet is an Open Source Platform for Enabling Integrated Management of Multi-Clouds.


[Get Started](#) [GitHub](#)

OUR APPROACH

### Discover and Manage Multi-Cloud Resources

Collect and categorize multi-cloud assets in ONE platform.  
Search cloud resources quickly and analyze them with detailed information in ONE dashboard.

[ <https://cloudforet.io> ]



Cloudforet

Open-source Multi & Hybrid Cloud Management Platform


25 followers <https://cloudforet.io> [admin@cloudforet.io](mailto:admin@cloudforet.io)

Overview Repositories 103 Projects 2 Packages Teams 8 People 22

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Manage All Cloud Resources in One Platform, Cloudforet.



Pinned

- console** (Public)  
Frontend Project for Open-source Multi & Hybrid Cloud Management Platform  
Vue ☆ 17 ▼ 10
- identity** (Public)  
Identity Service  
Python ☆ 6 ▼ 4
- inventory** (Public)  
Inventory Service  
Python ☆ 9 ▼ 2
- spacectl** (Public)  
Command Line Interface  
Python ☆ 7 ▼ 1
- docs** (Public)  
Documentation Site  
HTML ☆ 12 ▼ 3
- artwork** (Public)  
Cloudforet Artwork  
☆ 4

[ <https://github.com/cloudforet-io> ]



cloudforet-io

Announcements

Welcome to feedback Discussions!

Search all discussions

Sort by: Latest activity

Categories

- View all discussions
- Announcements
- General
- Issues
- Pull
- QA
- Stubs and test

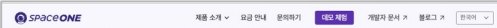
Most helpful

Be sure to mark someone's comment as an answer if it helps you resolve your question - they deserve the credit!

Community guidelines

Community insights

[ <https://github.com/cloudforet-io/feedback/discussions> ]




SPACEONE

제품 소개 | 요금 안내 | 문의하기 | **1800 센터** | 개발자 문서 | 블로그 | **회원가입**

## 멀티클라우드 관리를 하나로, SpaceONE

SpaceONE은 온프레미스부터 멀티클라우드 환경까지 IT 인프라 운영 방식을 혁신하는 클라우드 관리 플랫폼입니다.

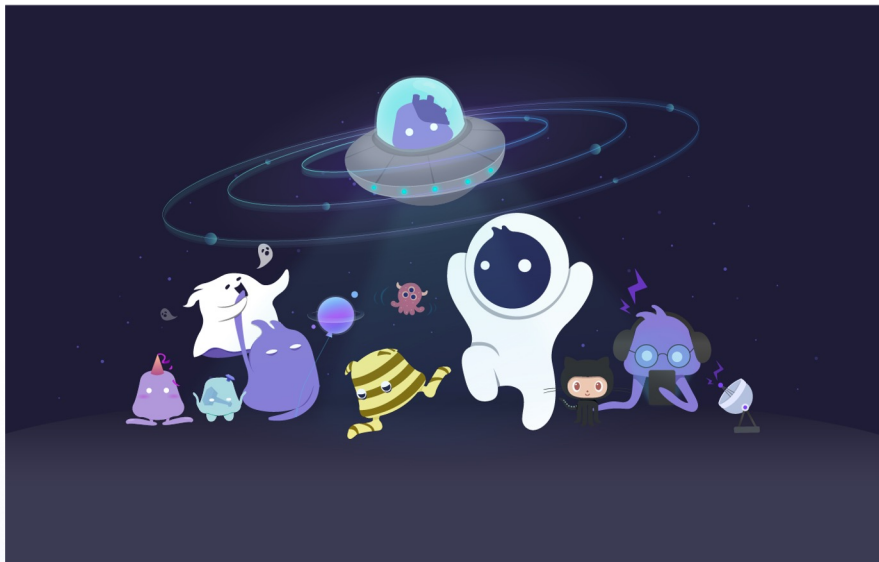
[무료로 체험해보세요](#)



[ <https://spaceone.megazone.io> ]

# Contact

멀티 클라우드 플랫폼을 Kubernetes 위에서 다루는 흥미로운 방법



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***bluese05@gmail.com (송지형)***

# 감사합니다.

bluese05@gmail.com



<https://cloudforet.io>  
<https://github.com/cloudforet-io>