

Task Manager en Minikube

MINIKUBE CLUSTER (Un solo nodo control-plane)

minikube (control-plane) - v1.33.1

frontend-6cfd7c46-rs4wp

Nginx + HTML/JS Container

Pod IP: 10.244.0.7
Puerto: 80
Status: Running
Age: 111m
Ready: 1/1

backend-6b76759676-r9852

Python Flask Container

SQLite + PVC Mount

Pod IP: 10.244.0.6
Puerto: 5000
Status: Running
Age: 111m
Ready: 1/1

victoria-metrics-577f7cf9f5-mhxs2

VictoriaMetrics Container

Pod IP: 10.244.0.8
Puerto: 8428
Status: Running
Age: 111m
Ready: 1/1

vmagent-5d48b7f985-n2ml5

VMAgent Container

Pod IP: 10.244.0.9
Puerto: 8429
Status: Running
Age: 111m
Ready: 1/1
Role: Métrica Collector

Services (ClusterIP)

frontend

ClusterIP: 10.104.205.255 | **Port:** 80/TCP

backend

ClusterIP: 10.97.120.114 | **Port:** 5000/TCP

victoria-metrics

ClusterIP: 10.102.195.102 | **Port:** 8428/TCP

vmagent

ClusterIP: 10.104.183.10 | **Port:** 8429/TCP

Persistent Volume para SQLite

PVC: sqlite-pvc (Bound)
Volume: pvc-0f3cc17b-6df2-4761-9987-644065d9dfc4
Capacity: 1Gi
StorageClass: standard
Access Mode: ReadWriteOnce

Flujo en Task Manager

Usuario accede via minikube service frontend → Frontend Service (10.104.205.255:80)

Frontend Service → Frontend Pod (10.244.0.7) - Nginx

JavaScript hace fetch() al API → Backend Service (10.97.120.114:5000)

Backend Service → Backend Pod (10.244.0.6) - Flask

Flask lee/escribe → SQLite en Persistent Volume (1Gi)

VMAgent recolecta métricas → VictoriaMetrics almacena

Arquitectura Implementada

- ✓ **Frontend:** Nginx + HTML/JS/CSS (Pod: frontend-6cfd7c46-rs4wp)
- ✓ **Backend:** Python Flask con SQLite persistente (Pod: backend-6b76759676-r9852)
- ✓ **Database:** SQLite en Persistent Volume de 1Gi (¡Ya no se pierden datos!)
- ✓ **Monitoring:** VictoriaMetrics + VMAgent funcionando
- ✓ **Cluster:** Minikube single-node (control-plane)
- ✓ **Total Pods:** 4 pods corriendo en un solo nodo

Comandos útiles para setup

```
# Acceder al frontend
minikube service frontend

# Ver métricas de VictoriaMetrics
minikube service victoria-metrics

# Ver logs del backend
kubectl logs backend-6b76759676-r9852

# Acceder al contenedor Flask
kubectl exec -it backend-6b76759676-r9852 -- /bin/bash

# Ver el SQLite persistente
kubectl exec -it backend-6b76759676-r9852 -- ls -la /app/

# Port-forward para desarrollo
kubectl port-forward svc/backend 5000:5000
kubectl port-forward svc/victoria-metrics 8428:8428
```

Componentes de Task Manager

- Minikube:** Cluster de Kubernetes local
- Node:** minikube (control-plane)
- Pods:** 4 pods corriendo aplicaciones
- Containers:** Nginx, Flask, VictoriaMetrics, VMAgent
- Services:** IPs estables para acceso
- PVC:** 1Gi storage persistente para SQLite