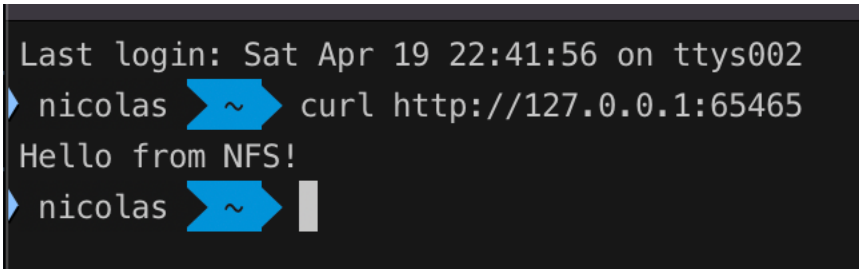
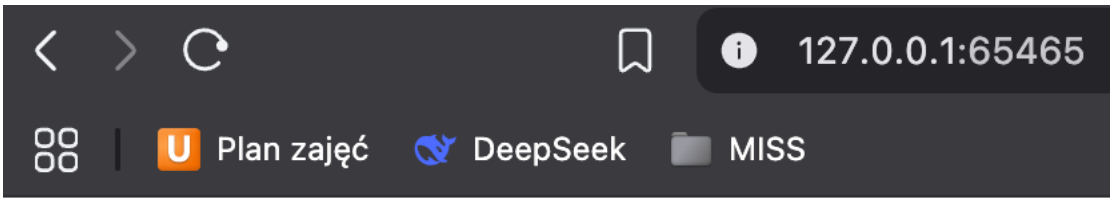
LSC Lab – 6 Kubernetes

Nicolas Stupak

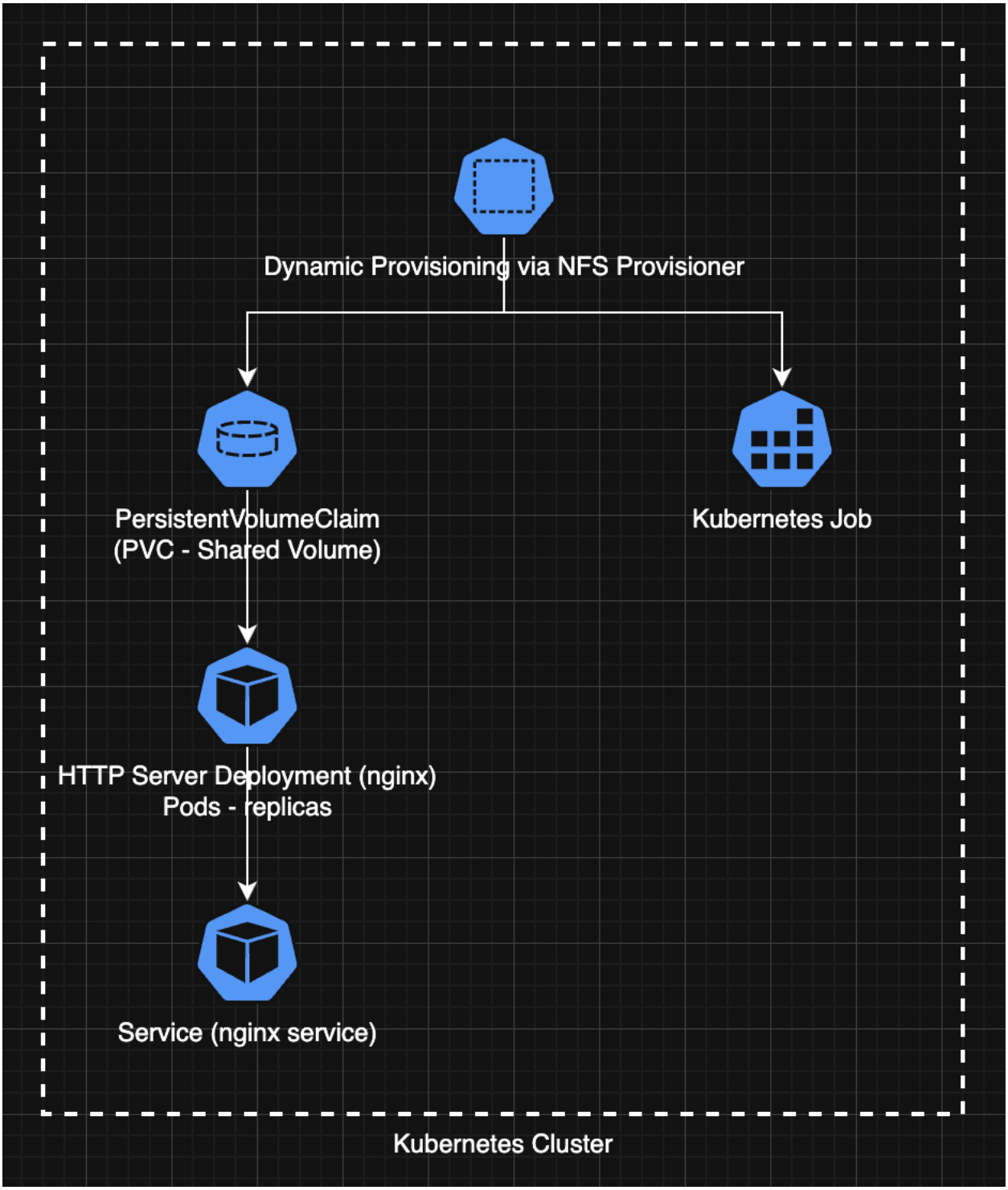
1. Proof of app working





Hello from NFS!

2. Architecture diagram



2.1 FNS Provisioner

An NFS Provisioner is a Kubernetes component that automatically creates and manages Persistent Volumes (PVs) backed by an NFS (Network File System) server. It dynamically provisions storage when a PersistentVolumeClaim (PVC) is requested, allowing pods to share storage across the cluster.

2.2 PersistentVolumeClaim

A PersistentVolumeClaim is a Kubernetes request for storage by a user or application. It dynamically binds to a PersistentVolume (like an NFS volume) to provide pods with persistent storage.

2.3 PersistentVolume

A PersistentVolume is a Kubernetes resource representing a piece of storage (like a disk or NFS share) provisioned in the cluster. It exists independently of pods, providing durable storage that persists even if pods are deleted.

2.4 Pod

A Pod is the smallest deployable unit in Kubernetes, representing one or more tightly coupled containers (e.g., NGINX + a logging sidecar) that share resources (like storage and network) and run together on the same node.

2.5 NGINX Service

An NGINX Service in Kubernetes is a stable network endpoint (like a load balancer or internal IP) that exposes one or more NGINX Pods to other applications or users, ensuring traffic is routed correctly even if Pods restart or scale.

The NGINX Service acts as a "front door" to NGINX Pods, providing a permanent IP/DNS name and load balancing across multiple replicas.

2.6 Kubernetes Job

A Kubernetes Job is a controller that runs a short-lived, one-time task (like a batch job or script) to completion, ensuring it executes successfully before terminating.

A Job creates one or more Pods to perform a task (e.g., data processing, backups) and ensures they run to completion (unlike Deployments, which run continuously).