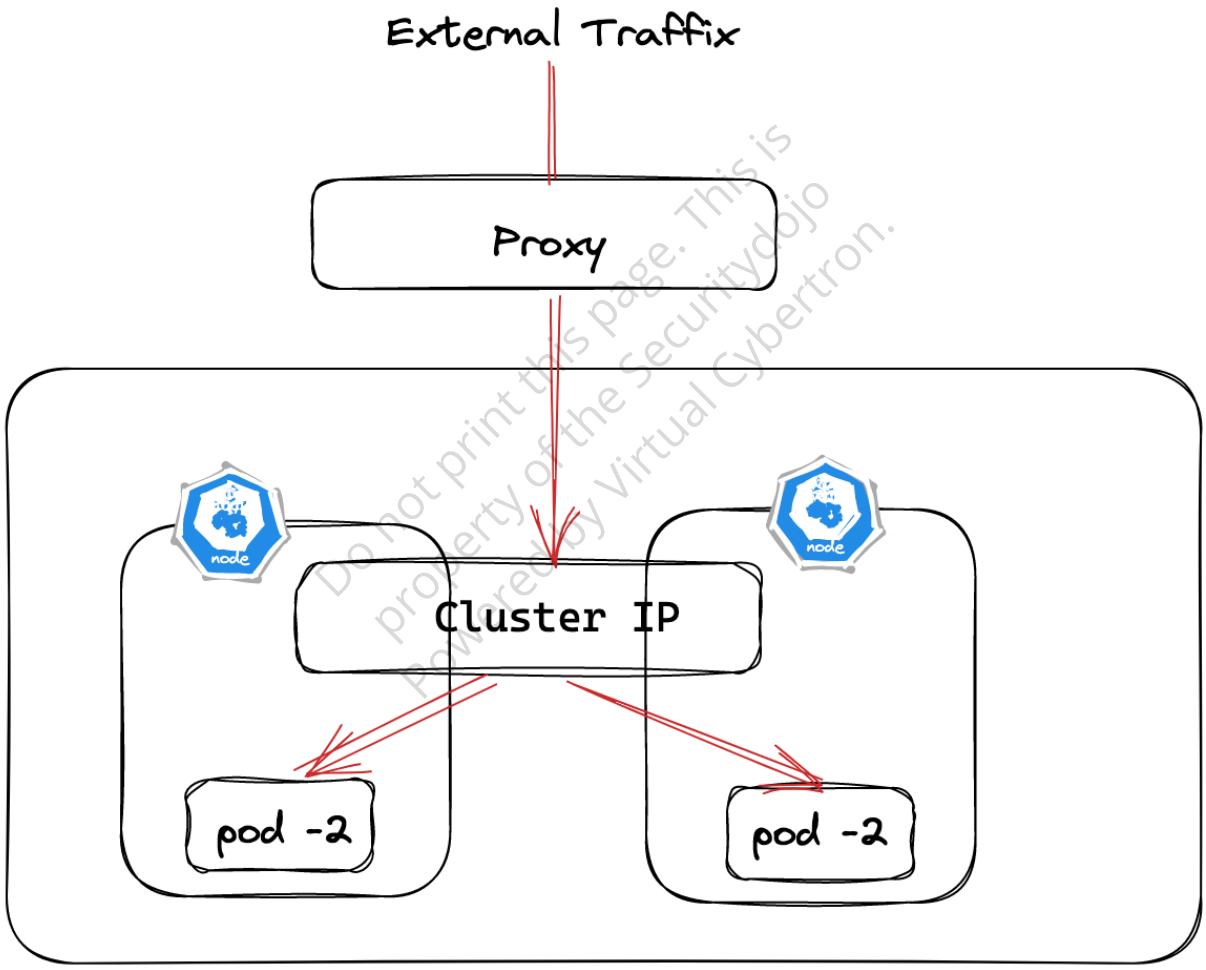
Services in Kubernetes

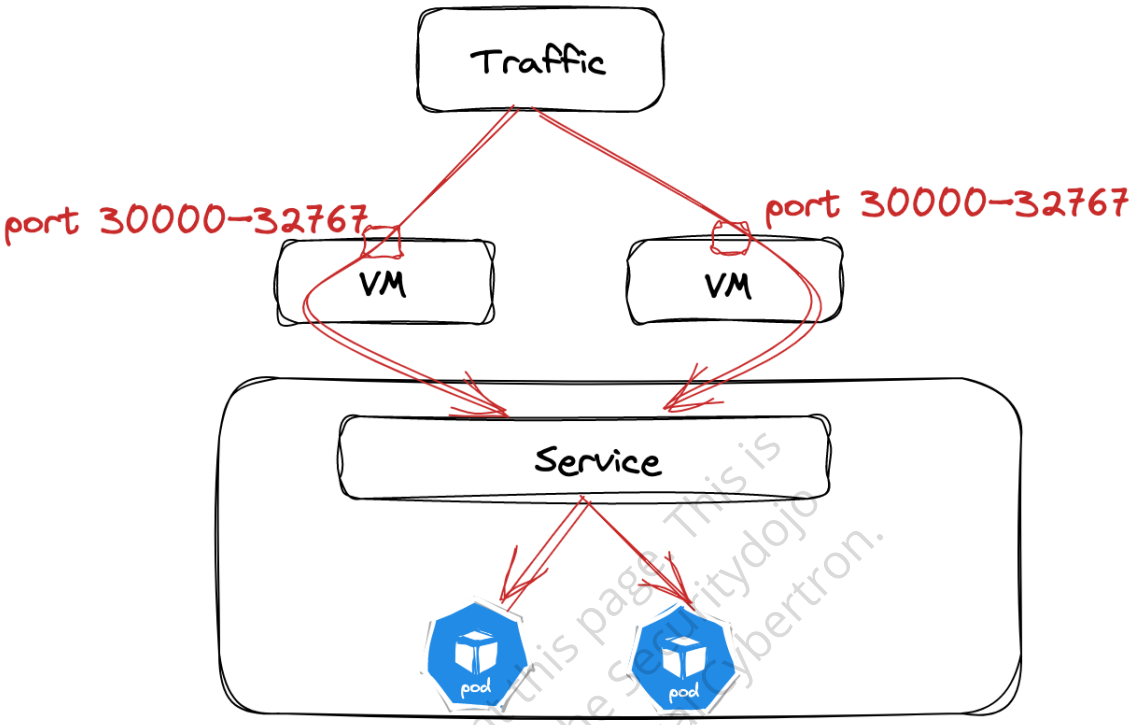
There are different ways to expose services in Kubernetes so both internal endpoints and external endpoints can access them. This Kubernetes configuration is pretty critical as the administrator could give access to attackers to services they shouldn't be able to access.

- **ClusterIP**: The default Kubernetes service is a ClusterIP service. It provides you with a service within your cluster that other cluster-based apps may access, also there is no external access.

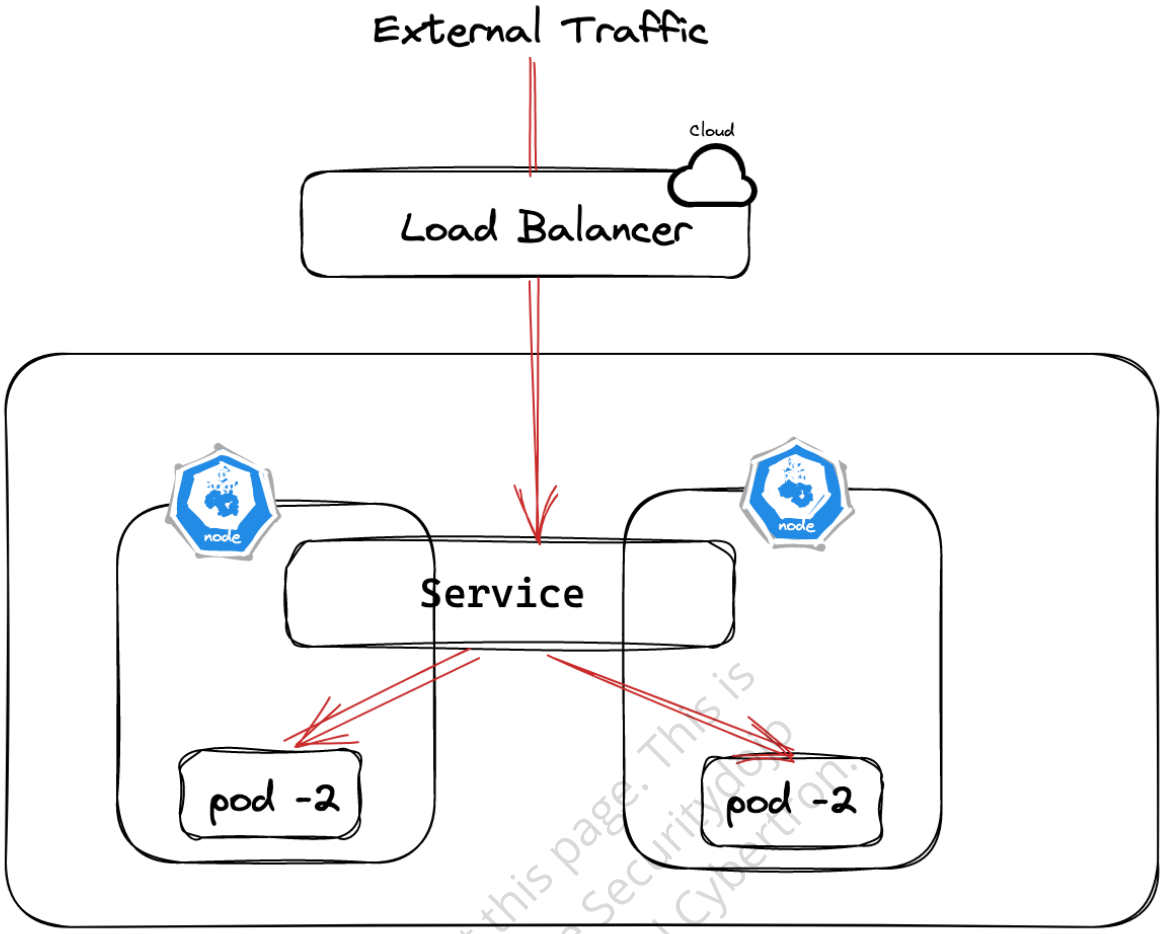


- **NodePort**: All of the nodes have a specific port opened by NodePort, and all traffic sent to this port is forwarded to the service.

Kubernetes creates a NodePort service, kube-proxy allocates a port in the range 30000-32767



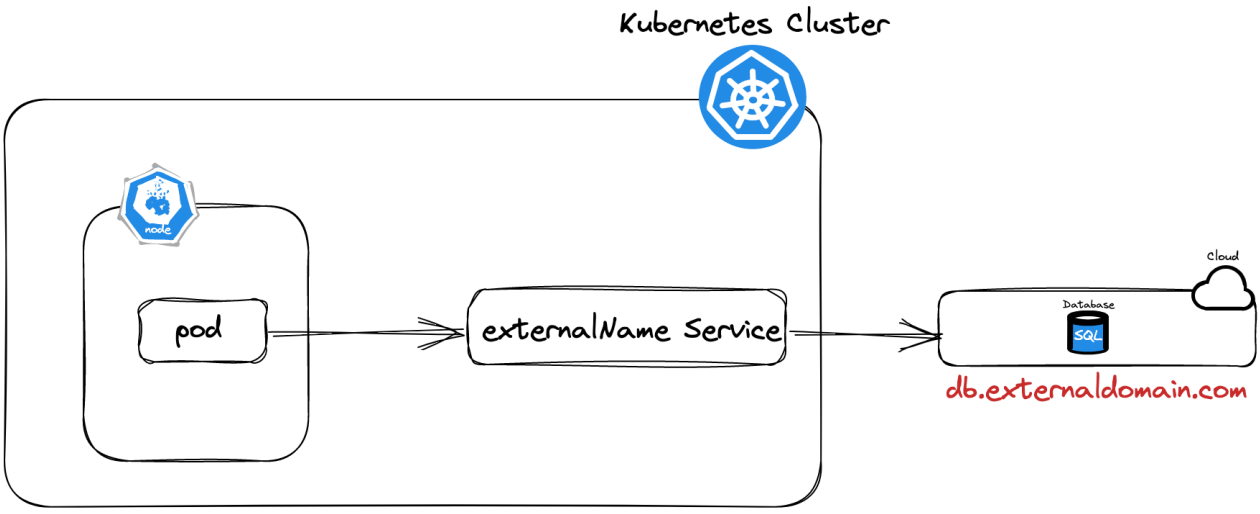
- **LoadBalancer**: Uses the load balancer of a cloud provider to externally expose the Service. A network load balancer will go up on GKE/EKS as a result, giving you a single IP address that will direct all traffic to your service.



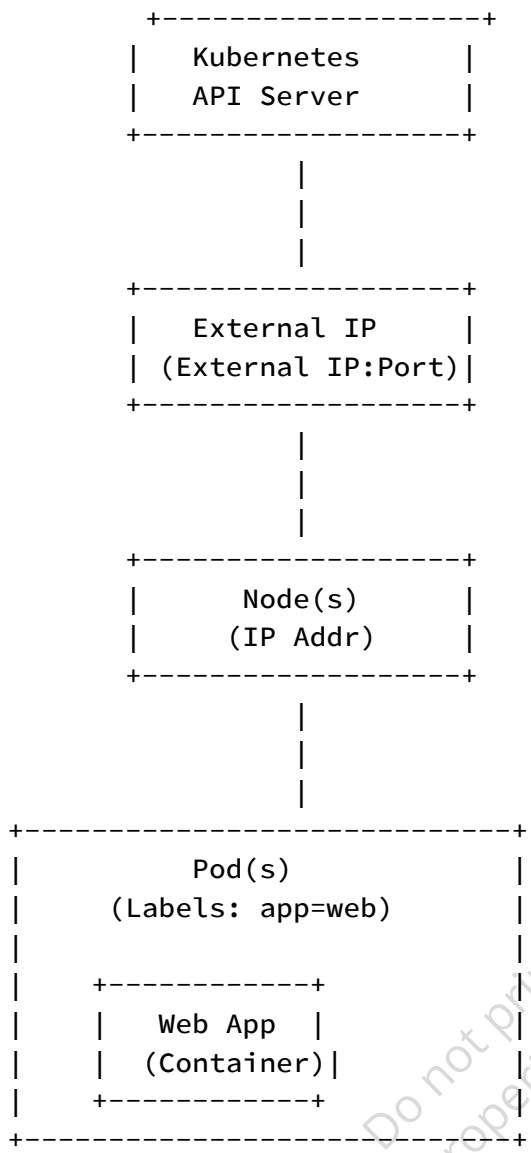
- **ExternalName**: Services of type ExternalName do not often map Services to selectors, but rather to DNS names. The spec.externalName parameter is used to specify these Services.

When looking up the service database-svc.prod.svc.cluster.local, the cluster DNS Service returns a CNAME record for database.securitydojo.com.

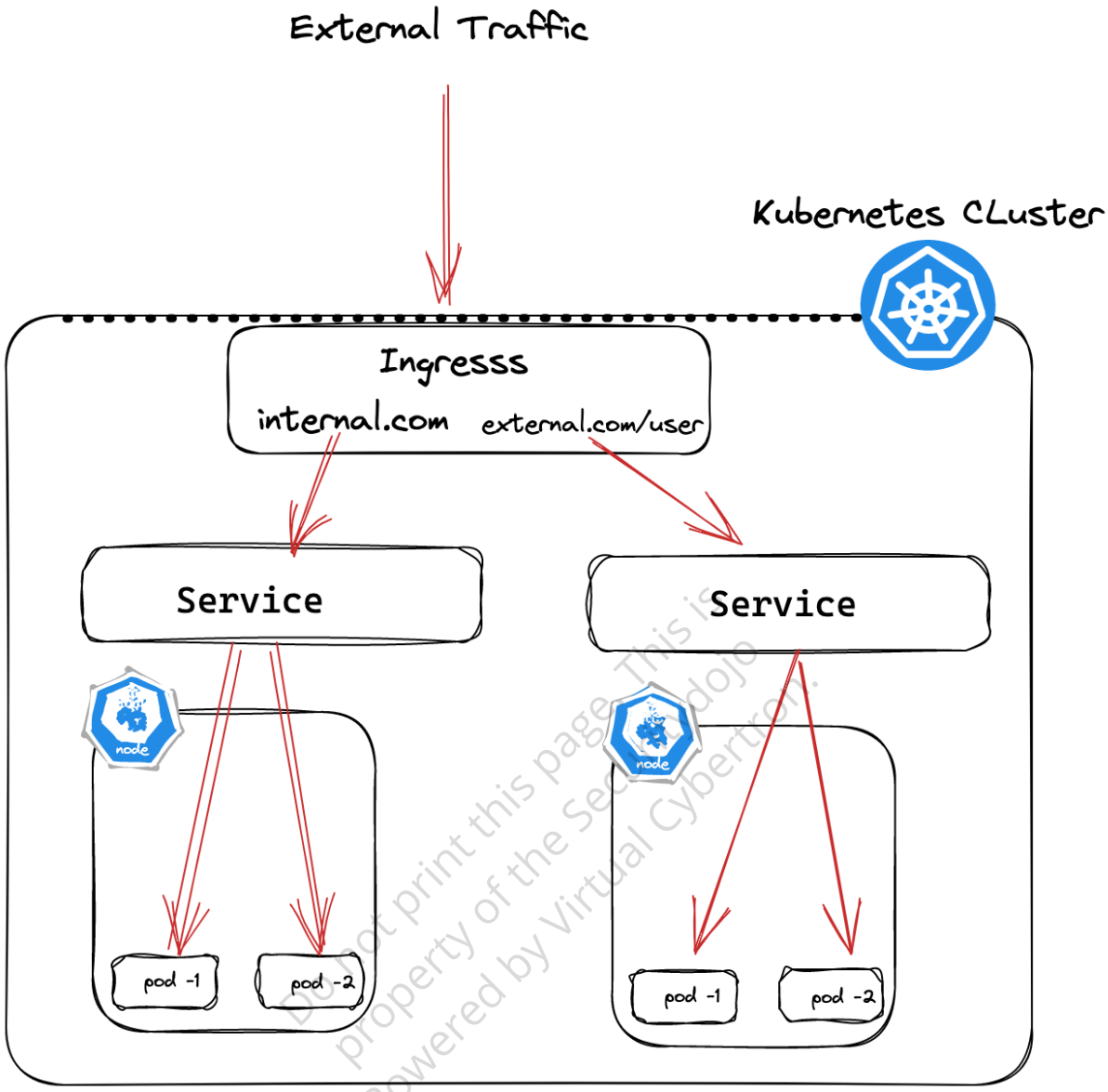
```
 apiVersion: v1
kind: Service
metadata:
  name: database-svc
  namespace: prod
spec:
  type: ExternalName
  externalName: database.securitydojo.com
```



- **External IPs**: One of the Service endpoints will receive traffic that enters the cluster using the external IP (as the destination IP) and the Service port.



- **Ingress**: Ingress is NOT a sort of service, in contrast to all the instances given above. Instead, it serves as a "smart router" or entrypoint into your cluster by sitting in front of several services and there are several types of Ingress controllers with various functionalities. Its an abstraction over layer 7 load balancers which provides layer7 load balancing, SSL termination and name based virtual hosting.



When should I utilise which of the Kubernetes NodePort, LoadBalancer, and Ingress service?

- Use NodePort to expose a Service on a static port that is accessible from outside the cluster.
- LoadBalancer when you need to provide high availability and scalability however the major disadvantage is that any service exposed to a LoadBalancer will have its own IP

address, and you must pay for a LoadBalancer per exposed service, which can be expensive.

- Ingress is used when multiple services must be managed and exposed under the same domain name while also providing extensive routing and load-balancing features.