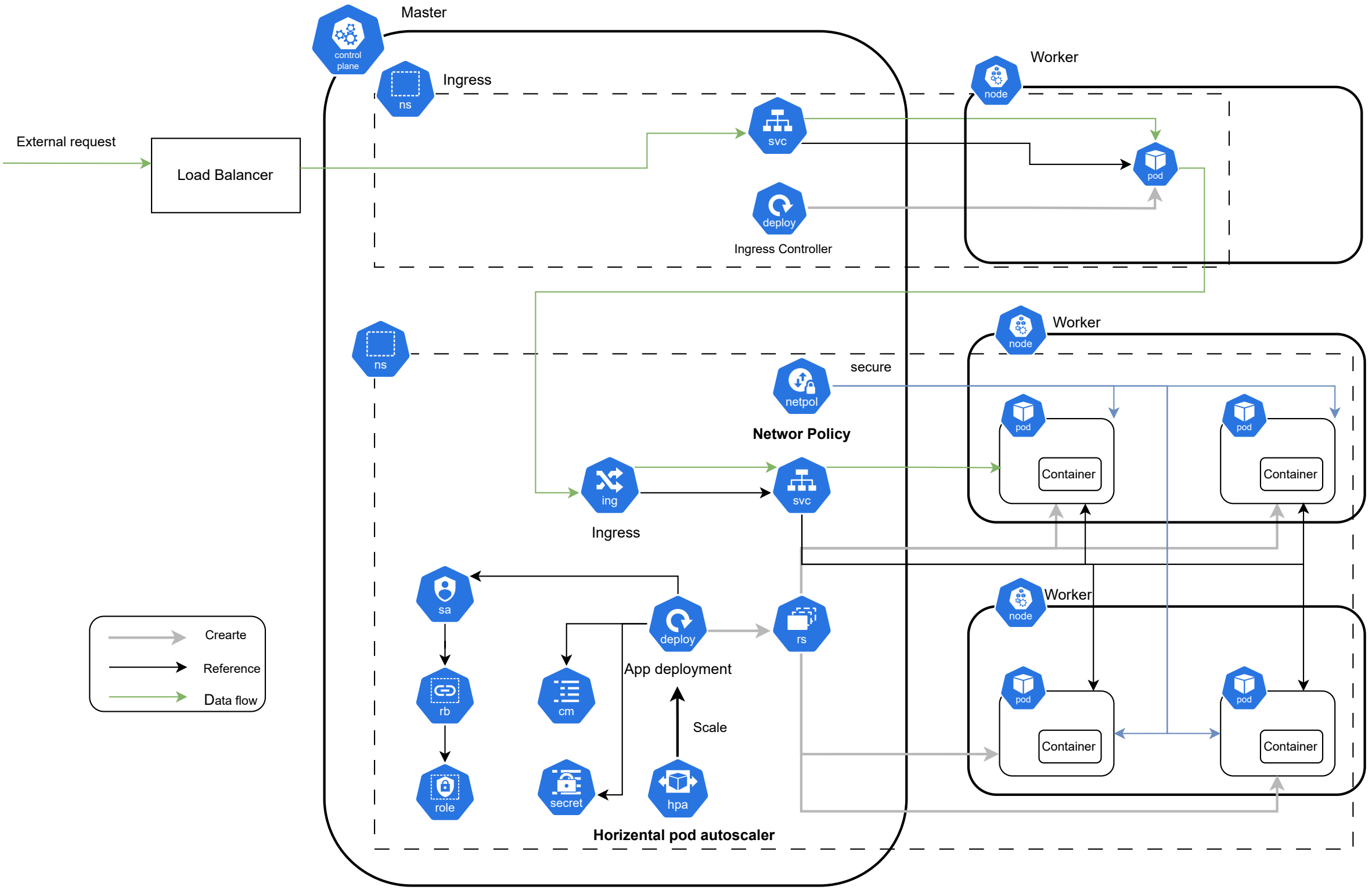
High Availability:
We ensure high availability by running multiple replicas of our application using the Deployment object. We use a Rolling Update strategy to ensure that the application remains available during updates and upgrades. Additionally, we use an Ingress Controller to manage external access to services in the cluster,providing a single entry point and enabling load balancing for increased availability.

Scalability:
We achieve scalability through horizontal pod autoscaling, which monitors the load on the app. When the usage of resources exceeds a specified target, the horizental autoscaler automatically scales the deployment which will create new pods. This ensures that our application can handle increased traffic by dynamically adjusting its number of replicas.



Security:

To ensure security in our cluster, we use NetworkPolicies to secure communication between pods. Additionally, we employ roles and role bindings to grant only the necessary permissions to our deployments within the cluster, and we also use secrets to secure our credentials.

Data Flow:

External requests to the cluster flow through the load balancer, which redirects them to the Ingress Controller. The Ingress Controller, based on defined rules in the Ingress object, forwards the requests to the appropriate service, which then directs the traffic to one of the specific pods. Note that while the diagram shows the service passing the request to only one pod for clarity, in reality, it can be redirected to any one of the pods for load balancing.