Why pod scenarios are important:

Use Cases and Importance of Pod-Level Chaos Scenarios

1. Single Pod Deletion

- Use Case: Simulates unplanned deletion of a single pod
- Why It's Important: Validates whether the ReplicaSet or Deployment automatically creates a replacement.
- Customer Impact: Ensures continuous service even if a pod unexpectedly crashes.
- Recovery Timing: Typically <10 seconds for stateless apps (seen in Krkn telemetry output).
- HA Indicator: Pod is automatically rescheduled and becomes Ready without manual intervention.

```
Kubectl delete pod <pod-name> delete pod <pod-name>
Kubectl get pods # watch for new pods
```

2. Multiple Pods Deleted Simultaneously

- Use Case: Simulates a larger failure event, such as a node crash or AZ outage.
- Why It's Important: Tests whether the system has enough resources and policies to recover gracefully.
- Customer Impact: If all pods of a service fail, user experience is directly impacted.
- HA Indicator: Application can continue functioning from other replicas across zones/nodes.

3. Pod Eviction (Soft Disruption)

- Use Case: Triggered by Kubernetes itself during node upgrades or scaling down.
- Why It's Important: Ensures graceful termination and restart elsewhere without user impact.
- Customer Impact: Should be zero if readiness/liveness probes and PDBs are correctly configured.
- HA Indicator: Rolling disruption does not take down the whole application.

How to Know If It's Highly Available

1. **Multiple Replicas Exist:** Confirmed by checking `kubectl get deploy` and seeing >1 replicas.
2. **Pods Distributed Across Nodes/availability zones:** Using `topologySpreadConstraints` or observing pod distribution in `kubectl get pods -o wide`.
3. **Service Uptime Remains Unaffected:** During chaos test, verify app availability (synthetic probes, Prometheus alerts, etc).
4. **Recovery Is Automatic:** No manual intervention needed to restore service.
5. **Krkn Telemetry Indicators:** End of run data includes recovery times, pod reschedule latency, and service downtime which are vital metrics for assessing HA.