**Taint & Toleration**

In **Kubernetes**, **taints** and **tolerations** are used **to control which pods can be scheduled onto which nodes**. They help ensure workloads are placed only on suitable nodes, especially in environments with mixed workloads or special hardware needs.

## 🔹 What is a Taint?

A **taint** is applied to a **node**, and it tells Kubernetes:

“Don’t schedule any pods here unless they can tolerate this taint.”

Taint = **repels pods** unless they have the matching **toleration**.

Taint Structure:



**Effects:**

* **NoSchedule** – Do not schedule pods that don't tolerate the taint.
* **PreferNoSchedule** – Try to avoid scheduling pods that don’t tolerate it, but it’s not guaranteed.
* **NoExecute** – Existing pods will be evicted if they don’t tolerate this taint.

Example:



This means:

Node node1 will not accept any pods unless they tolerate the db=postgres taint.

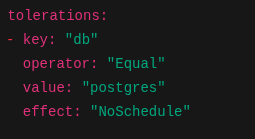
## 🔹 What is a Toleration?

A **toleration** is applied to a **pod**, and it tells Kubernetes:

“This pod can tolerate (i.e., be scheduled on) nodes with matching taints.”

Toleration = **permits scheduling onto tainted nodes**, if it matches.

### Toleration Structure (in a Pod spec):



This toleration matches the taint db=postgres:NoSchedule, meaning the pod can now be scheduled on nodes with that taint.

Operator: Equal (by deafult, even though if you not specify), Exist

🔍 Summary Table

| Feature | Taint | Toleration |
| --- | --- | --- |
| Applied To | Node | Pod |
| Purpose | Repels pods unless tolerated | Allows pods to be scheduled on tainted nodes |
| Syntax | key=value:effect | YAML list under spec.tolerations |
| Used For | Node-level isolation and control | Workload targeting and node filtering |