Creating POD in Kubernetes

1 Process 1: Authentication and Authorization

API **SECURE ACCESS**

The user submits a request to the Kubernetes API server using the kubectl command-line tool.

Status : This process happens behind the pscenes for authorized users.

2 Process 2: Manifest Syntax Check

POD **MANIFEST VALIDATION**

The API server validates the YAML manifest for syntax errors.

Status : The kubectl apply command will return an error message if the manifest has syntax errors.

METHOD	DESCRIPTION
Kubectl run	User-friendly command-line approach for quick POD creation.
YAML Manifest	Flexible and detailed approach for defining POD creation.

YAML file named pod.yaml

```
apiVersion: v1
kind: Pod
metadata:
  name: my-nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:latest
    ports:
    - containerPort: 80
```

Use any text editor to create YAML file.
No command-line execution is required at this stage

`kubectl apply -f pod.yaml`

3 Process 3: Writing to etcd

POD **POD DEFINITION STORAGE**

If the manifest is valid, the API server stores the POD definition in etcd.

Status : The API server acknowledges successful storage of the POD creation.

4 Process 4: Pod Scheduling

POD **POD SCHEDULING**

The Kubernetes scheduler selects a node from the cluster that meets the POD's resource requirements.

Status : You can check the POD schedule using kubectl get PODS.

5 Process 5: Reporting to API

POD **SCHEDULER COMMUNICATION**

TThe scheduler sends a POD object with the assigned node information back to the API server.

Status : This is internal communication between the scheduler and API server.

6 Process 6: Sending connection request to kubelet

POD DEPLOYMENT

The API server communicates the POD object to the kubelet, the agent running on each node, responsible for managing pods.

Status : This is internal communication between the API server and scheduler.

7 Process 7: Pod Status Update

POD STATUS MONITORING

The kubelet pulls the container image, creates containers, and starts the POD.

Status : Use kubectl get PODS to monitor the POD status. It will transition from Pending to Running once the POD is up and running.

Benefits of Using YAML Manifests:

YAML manifests offer several advantages over `kubectl run` for creating PODS in Kubernetes:

- **Reusability:** Easily save and reuse the same POD configuration for multiple deployments.
- **Version Control:** Track changes to your POD definitions using a version control system like Git.
- **Complex Configurations:** Define intricate POD configurations with multiple containers, environment variables, and resource requests/limits more effectively compared to the single command offered by `kubectl run` .