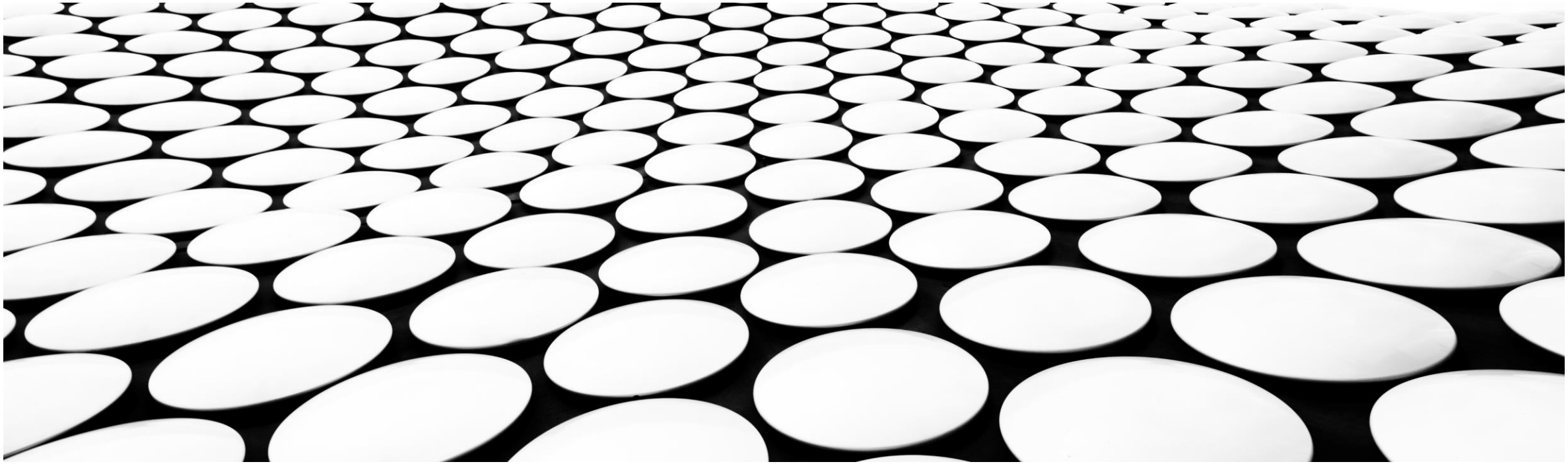
CONTAINER PIPELINES WITH ORACLE CLOUD

DJ (DHANANJAYAN)

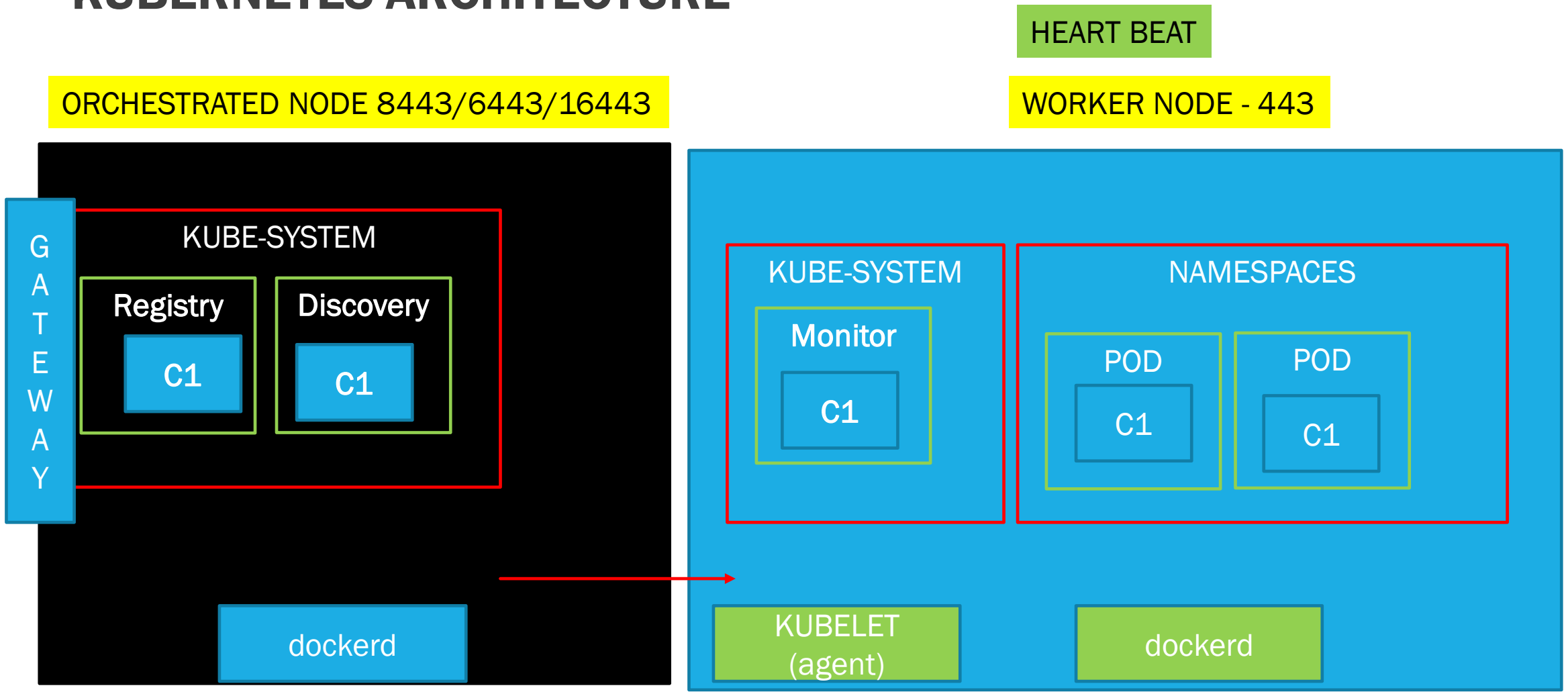
DAY 4 – 02 JULY 2020



DAY 4

- POD Architecture
- Services Architecture
- Replication
- Communication – Discovery
- Configurations
- Service management and Scope
- Logging and Troubleshooting
- Use case – Communication

KUBERNETES ARCHITECTURE



ORCHESTRATOR SERVICES

Gateway	Registry	Discovery	Router
KUBE DNS (Core DNS)	-ETCD key value pair registry	API SERVER (Trace where services)	DNS – Router
NGINX PLUS	Zoo Keeper (Big Data)		Nginx
JETTY	Kong (rdbms..)		VOYAGER – ENVOY
VERTIX	Eureka (no SQL)	Ribbon (Client Side)	ISTIO. LINKERD
OTD	Consul IO (no SQL)		TRAFFEIK

#KUBECTL API-RESOURCES

Version of kubectl → Server Version ?

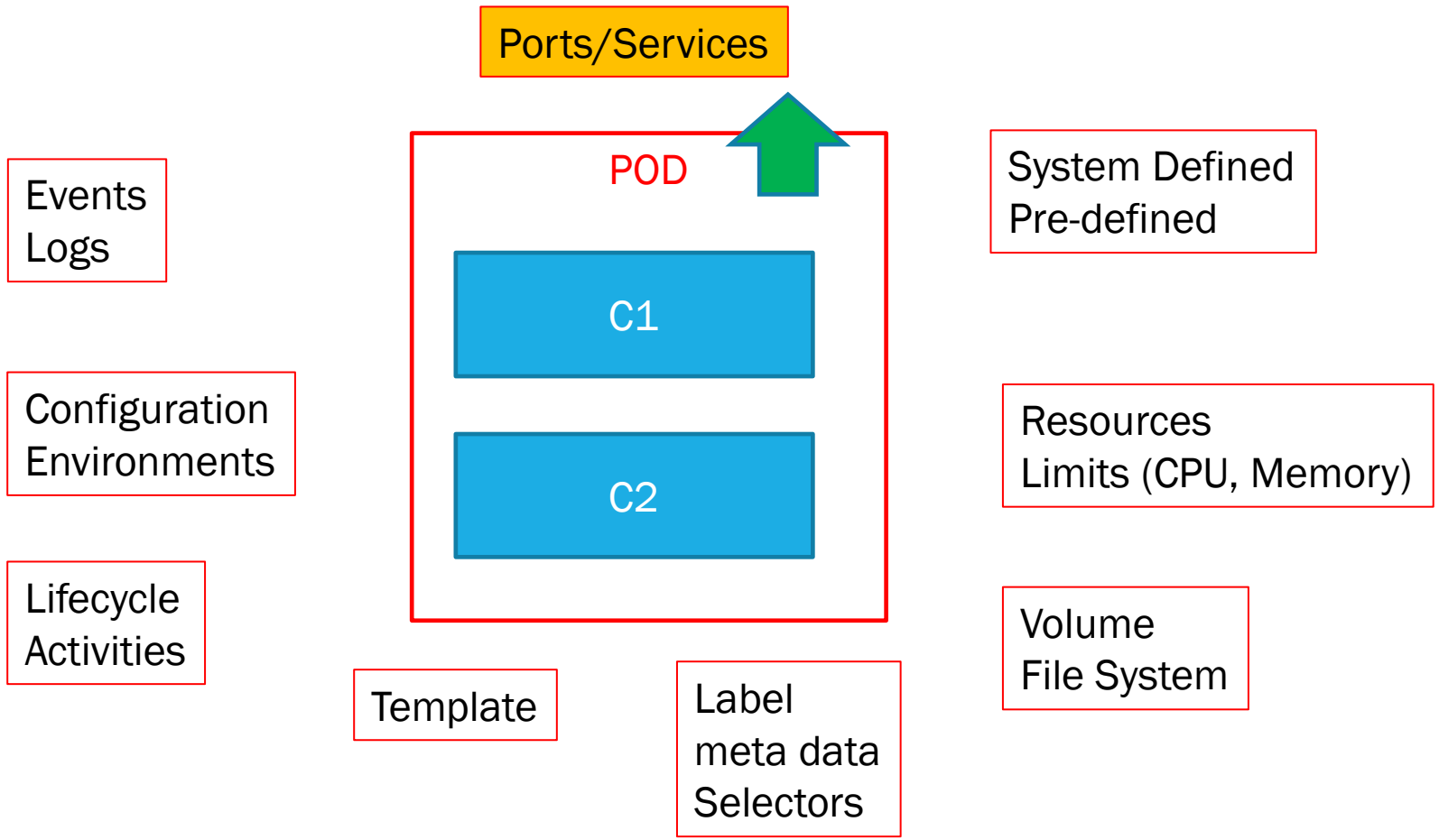
- Name of the object → CLI
- Short Description of the Object → CLI for Abbreviated object
- API Library – YAML (Object Source)
- Namespaced – True/False → CLI /YAML
- Kind → YAML

POD DEFINITION

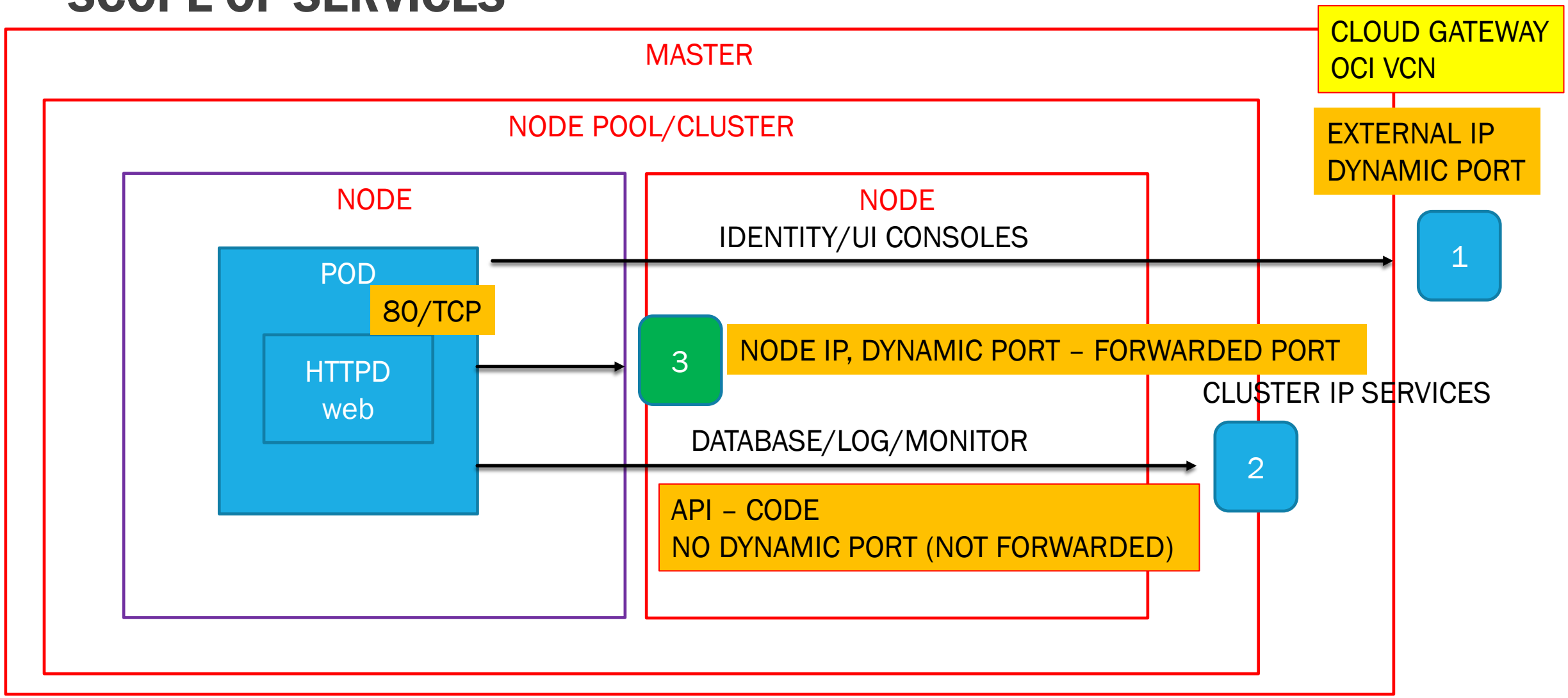
Stand Alone Pods	Deployment
Simple , 1x1 Pods , POC or testing	Replicated Pods High Availability of Service
Name of Pod, Name of Container, Name of Image	Collection of Similar pods –httpd (Service)
#kubectl run	
1 Service → 1 POD (End Point – 1 Pod)	1 Service → replicas pod (# end points…)

CLI → Create, Maintain, Delete (CRUD)
YAML → Create and Delete (Declarative)

POD ARCHITECTURE



SCOPE OF SERVICES

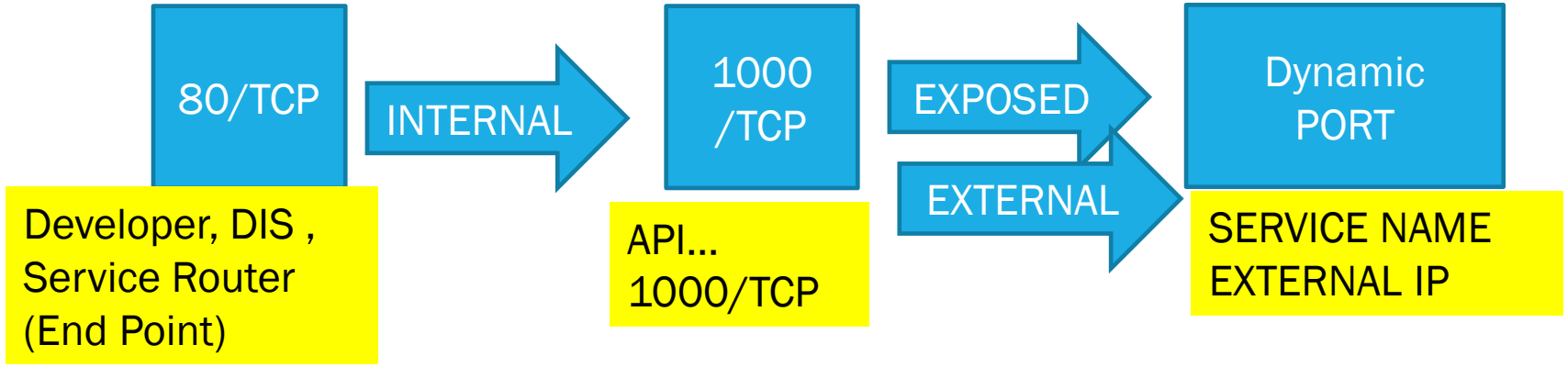


SERVICE TYPE

- SERVICES ARE PUBLIC WITHIN CLUSTER
  - LIMIT SERVICE FOR SELECTIVE (NETWORK POLICY)
- SERVICE NAME
- FORWARDED PORT*
- SERVICE DNS ENTRY (SERVICE DISCOVERY)
  - SERVICE_NAME.NAMESPACE_NAME.SVC.CLUSTER.LOCAL
- SERVICE IP (PRIMITIVE APPS)

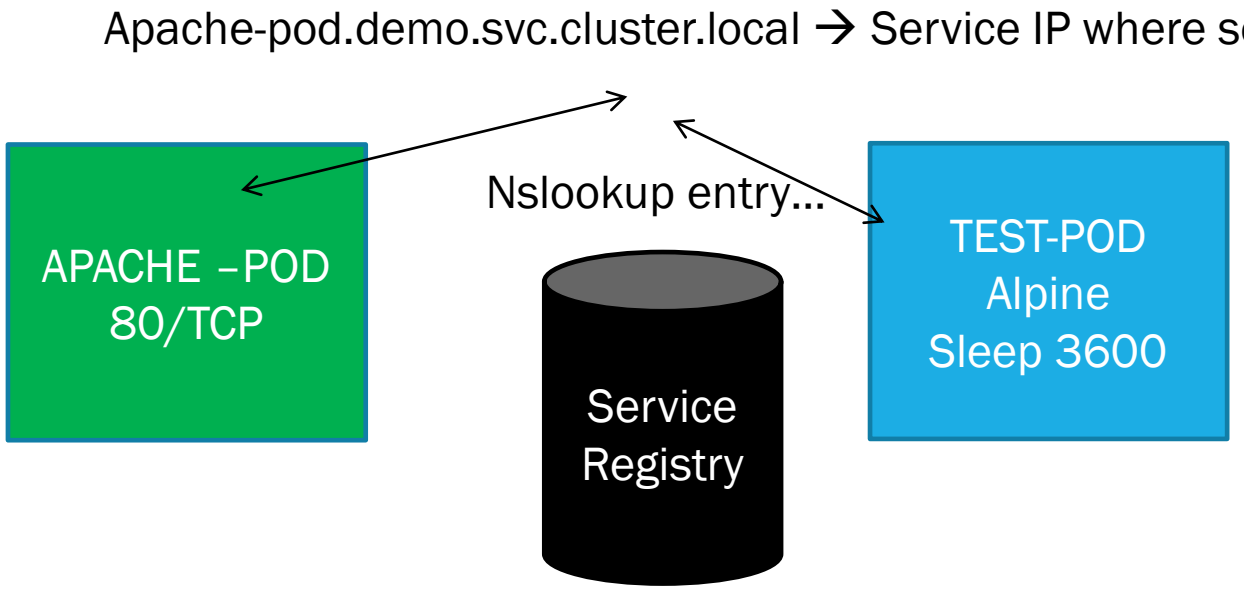
TARGET-PORT : IMAGE_PORT: 80/TCP
FORWARDED_PORT: DYNAMIC PORT
(30,000 – 32767)
MASKED_PORT : 100/TCP
(Internally 80 , Externally 100)

Alpine → #nslookup…
Sleep 3600

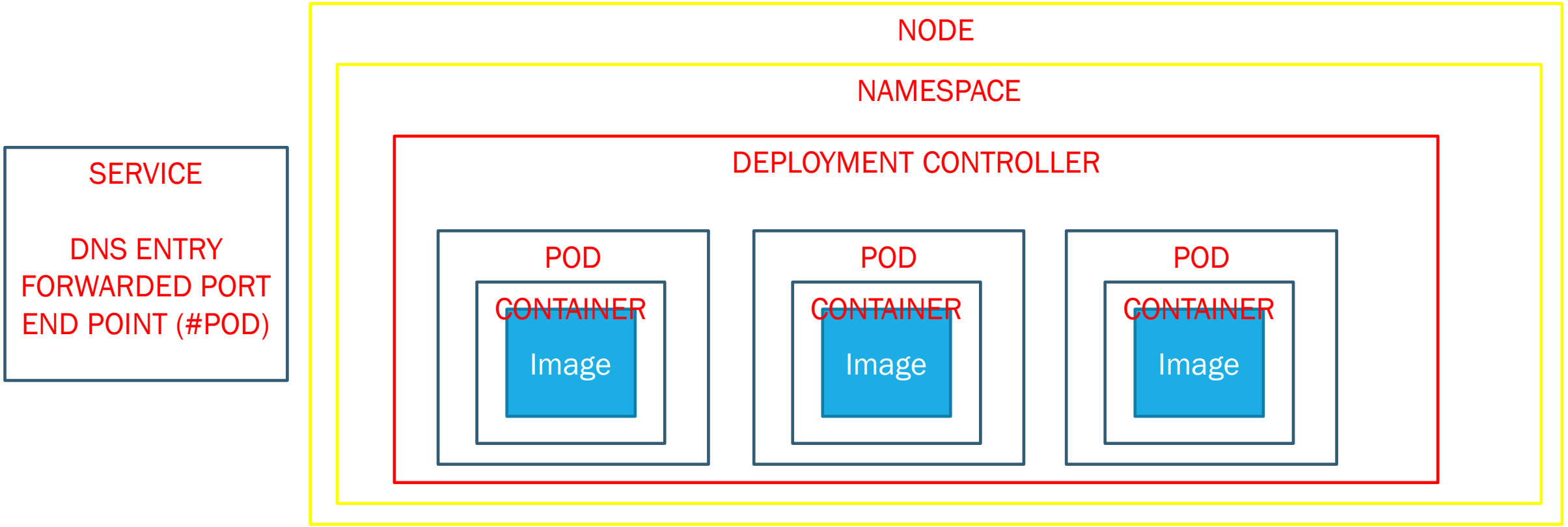


EXPOSURE TYPES – COMPARISON

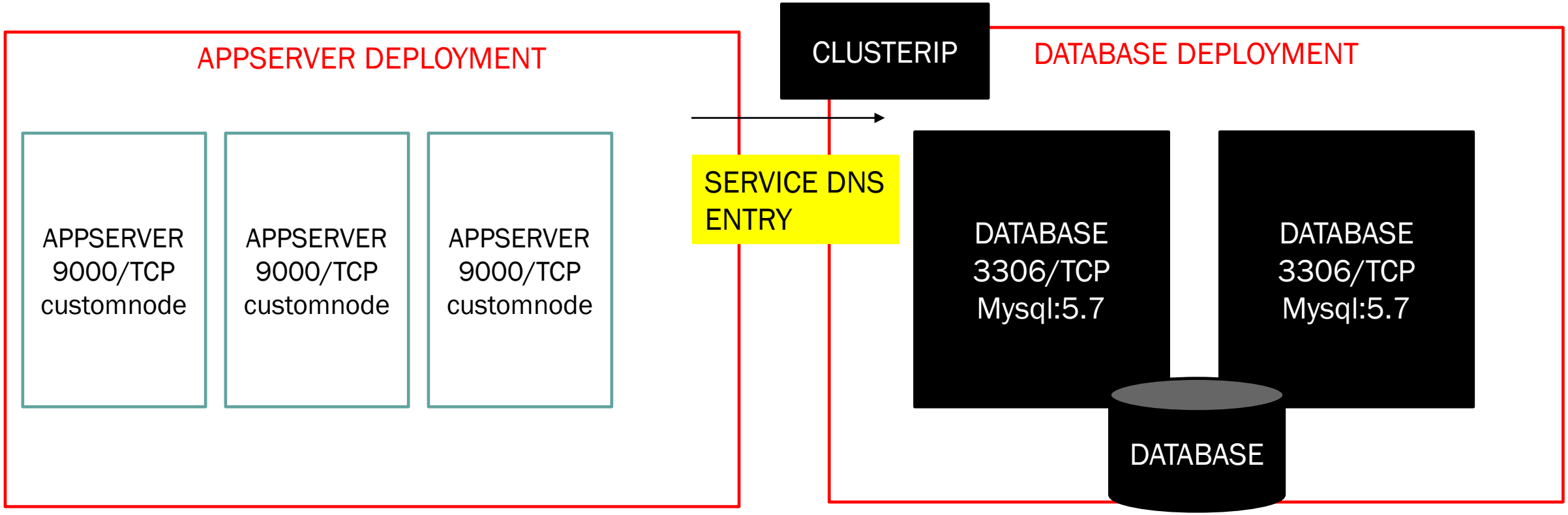
1. Internal Service	2. Cloud Exposure	3 . Node Port Exposure
Internal to Cluster (ClusterIP)	External to Gateway	External to Node (NodePort)
Service available within SSH , Within API , Within POD	Requries Cloud Creates External IP Accessible Public outside the cluster	Internal via Service IP.. Access it externally via Node IP (Curl…) Not necessary within POD.. Only for those who have access to Node IP !



ABSTRACTION– DEPLOYMENTS…



USE CASE WITH DEPLOYMENTS



IMPLEMENTATION :

- ACCESS DOCKER ENVIRONMENT
- BUILD DOCKER IMAGE FOR DATABASE
- CREATE DEPLOYMENT FOR DATABASE
- EXPOSE DATABASE AS INTERNAL SERVICE
- VERIFY DATABASE IS RUNNING WITH YOUR SCHEMAS
- SCALE DATABASE DEPLOYMENT to 2 REPLICAS
- RESERVER SERVICE DNS ENTRY FOR DATABASE
  mysql.sample.svc.cluster.local

- ACCESS DOCKER ENVIRONMENT
- SEED SERVICE DNS ENTRY INTO APP CODE
- CREATE DOCKER IMAGE FOR APPSERVER
- CREATE DEPLOYMENT FOR APPSERVER
- EXPOSE APPSERVER AS EXTERNAL SERVICE
- VERIFY APPSERVER IS RUNNING
- SCALE APPSERVER DEPLOYMENT to 3 REPLICAS
- VERIFY OUTPUT

PERSISTENT VOLUME

STORAGE CLASS
READ/WRITE

VOLUME
WHERE ?
SIZE
SC
MODE:

CLAIM
LIMIT
MODE : R/W
VOLUME ?

POD

DATA OF VOLUME

POD

DATA OF VOLUME

NAMESPACE : QUOTA

- LIMIT NAMESPACE BY BUDGET
  - INFRA BUDGET – MEMORY, RESOURCE
  - COUNT – POD, SERVICES, DEPLOYMENTS..
- CROSS LIMIT → FORBIDDEN
- QUOTA : 4 → SAMPLE NS (VIOLATING QUOTA) → NEW OBJECTS.
- NEW QUOTA FOR NAMESPACE → 6 PODS (MAX):
- CREATE DEPLOYMENT FOR 2 PODS REPLICAS ?

TROUBLESHOOT KUBERNETES !

Command Issued – No Syntax Error Object is not created	Command Issued – Object Created, Object is not in Desirable State	Command Issued , Object Created, Object Desired State, Service not running as per desired State
Quota Exceeded for NS Nodes do not have Taint.. Locked Nodes for Deployments. Quota Exceeded for Cluster	Object Created. ImagePullBackOff Error → Network ,Cannot connect to Image Repository. CrashLoopBackoff → Restart Service ? (BootStrapping Issue)→ Docker Image ? ErrImagePull → Invalid Image in Repository (Check name of Image)	Service Issue Resource Issue Code Issue
# kubectl get events (Event Log)	#kubectl describe <object>	#kubectl logs <object>