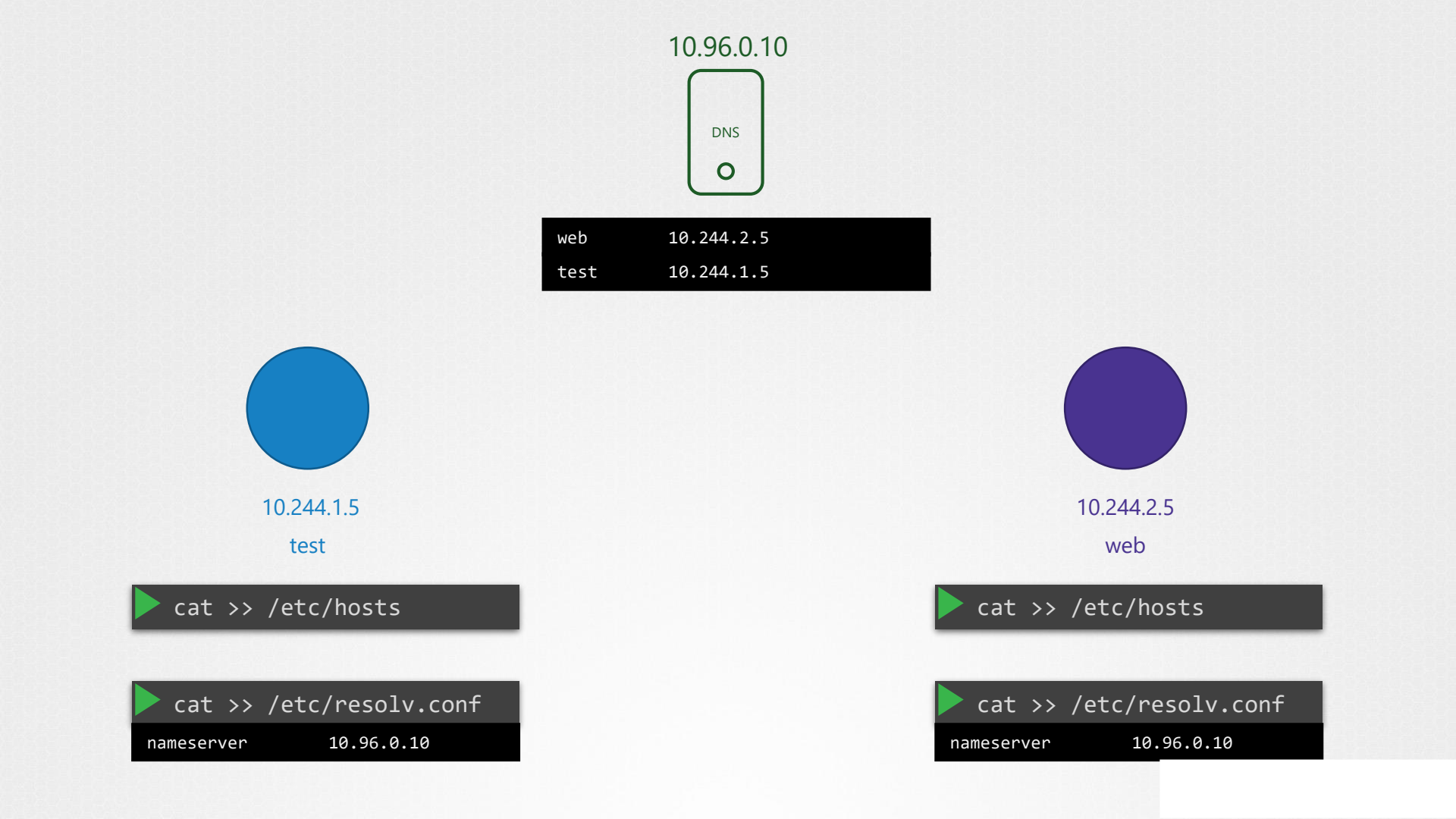
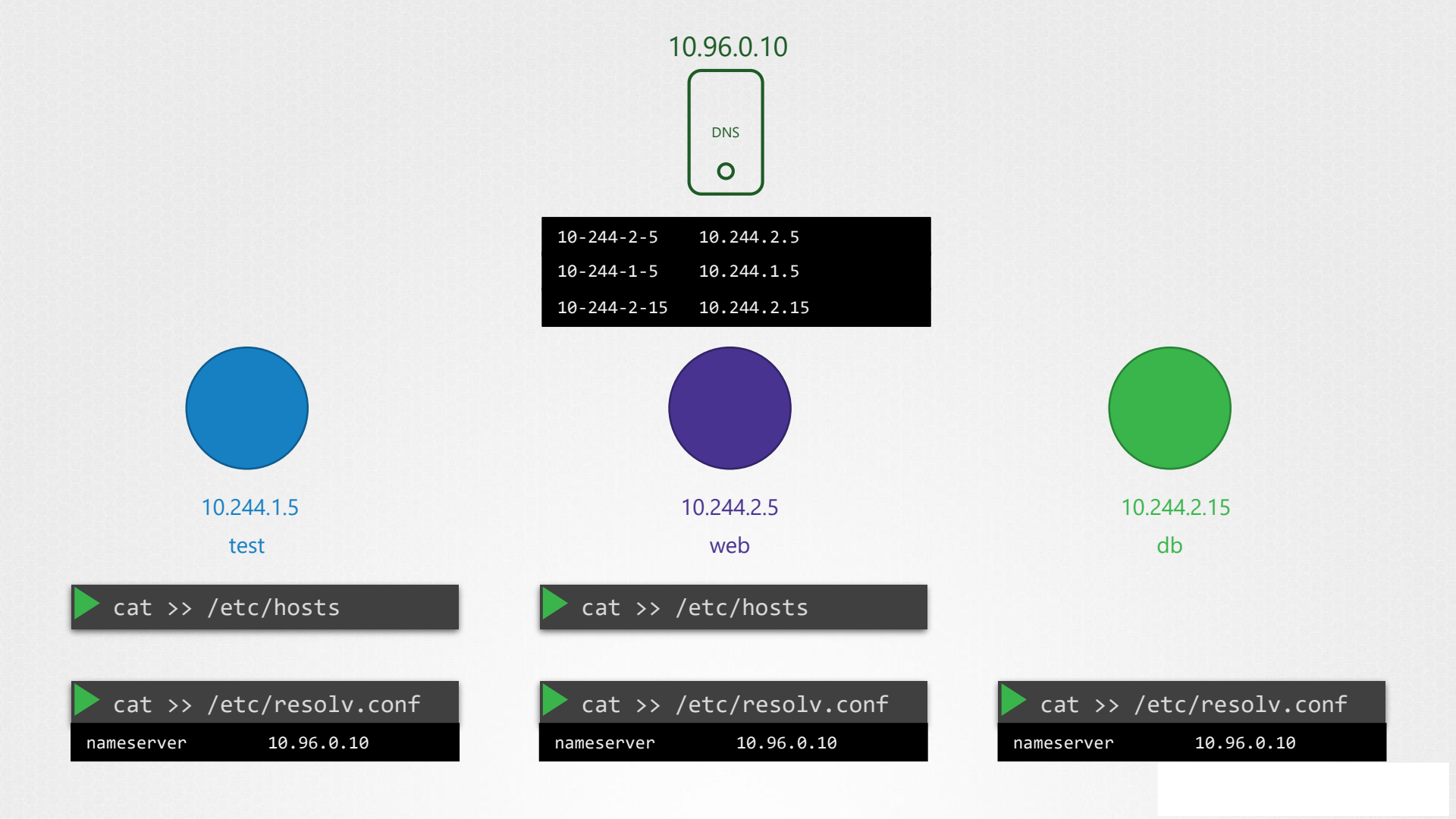
Course Objectives

- Scheduling
- Logging Monitoring
- Application Lifecycle Management
- Cluster Maintenance
- Security
- Storage
- Troubleshooting
- Core Concepts
- Networking
  - Pre-Requisites – Switching, Routing
  - Pre-Requisites – DNS
  - Networking Configuration on Cluster Nodes
  - Service Networking
  - Cluster DNS
  - Pre-Requisites – Tools
  - Pre-Requisites – Networking in Docker
  - POD Networking Concepts
  - Network Loadbalancer
  - Pre-Requisites CNI
  - CNI in Kubernetes

How Kubernetes Implements DNS?


10.96.0.10
DNS
web 10.244.2.5
test 10.244.1.5
10.244.1.5
test
10.244.2.5
web
cat >> /etc/hosts
cat >> /etc/hosts
cat >> /etc/resolv.conf
nameserver 10.96.0.10
cat >> /etc/resolv.conf
nameserver 10.96.0.10


10.96.0.10
DNS
10-244-2-5 10.244.2.5
10-244-1-5 10.244.1.5
10-244-2-15 10.244.2.15
10.244.1.5
test
10.244.2.5
web
10.244.2.15
db
cat >> /etc/hosts
cat >> /etc/hosts
cat >> /etc/resolv.conf
nameserver 10.96.0.10
cat >> /etc/resolv.conf
nameserver 10.96.0.10
cat >> /etc/resolv.conf
nameserver 10.96.0.10

kube-dns

10.96.0.10

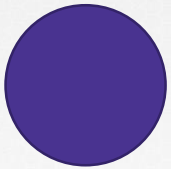
```
10-244-2-5     10.244.2.5
10-244-1-5     10.244.1.5
10-244-2-15    10.244.2.15
```

10.244.1.5

test

```
cat >> /etc/hosts
```

```
cat >> /etc/resolv.conf
nameserver        10.96.0.10
```



10.244.2.5

web

```
cat >> /etc/hosts
```

```
cat >> /etc/resolv.conf
nameserver        10.96.0.10
```

10.244.2.15

db

```
cat >> /etc/resolv.conf
nameserver        10.96.0.10
```

10.96.0.10

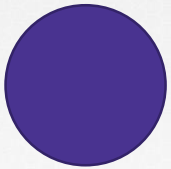
```
10-244-2-5      10.244.2.5
10-244-1-5      10.244.1.5
10-244-2-15     10.244.2.15
```

10.244.1.5

test

```
cat >> /etc/hosts
```

```
cat >> /etc/resolv.conf
nameserver      10.96.0.10
```



10.244.2.5

web

```
cat >> /etc/hosts
```

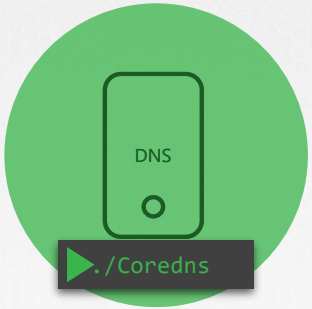
```
cat >> /etc/resolv.conf
nameserver      10.96.0.10
```

10.244.2.15

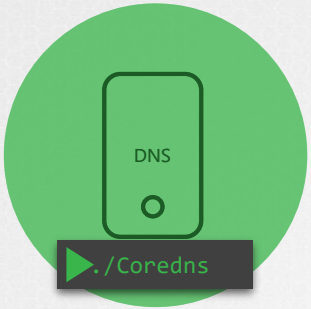
db

```
cat >> /etc/resolv.conf
nameserver      10.96.0.10
```

CoreDNS



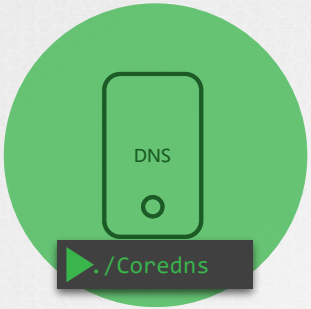
CoreDNS




```
cat /etc/coredns/Corefile
.:53 {
    errors
    health
    kubernetes cluster.local in-addr.arpa ip6.arpa {
       pods insecure
       upstream
       fallthrough in-addr.arpa ip6.arpa
    }
    prometheus :9153
    proxy . /etc/resolv.conf
    cache 30
    reload
}
```

10-244-1-5	default	pod	cluster.local	10.244.1.5

CoreDNS




```
cat /etc/coredns/Corefile
```

```
.:53 {
    errors
    health
    kubernetes cluster.local in-addr.arpa ip6.arpa {
       pods insecure
       upstream
       fallthrough in-addr.arpa ip6.arpa
    }
    prometheus :9153
    proxy . /etc/resolv.conf
    cache 30
    reload
}
```

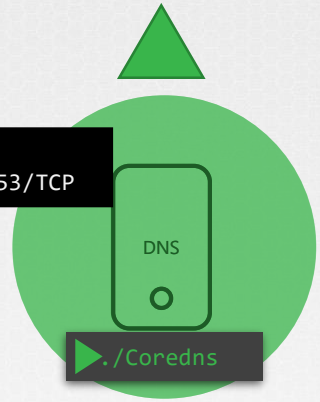
```
kubectl get configmap -n kube-system
```

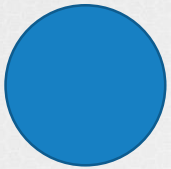
```
NAME                                 DATA      AGE
coredns                              1         168d
```

CoreDNS

```
kubectl get service –n kube-sytem
```

```
NAME        TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)
kube-dns    ClusterIP   10.96.0.10    <none>         53/UDP,53/TCP
```





10.244.1.5

test

```
10-244-1-5      10.244.1.5
10-244-2-5      10.244.2.5
web-service     10.107.37.188
```

10.107.37.188

web-service

10.244.2.5

web

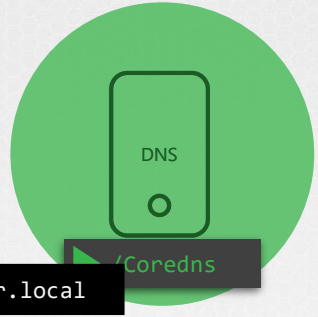
```
cat /etc/resolv.conf
```

```
nameserver              10.96.0.10
```

```
cat /var/lib/kubelet/config.yaml
```

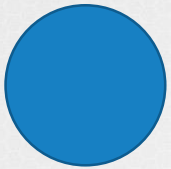
```
...
clusterDNS:
- 10.96.0.10
clusterDomain: cluster.local
```

CoreDNS




```
cat /etc/resolv.conf
nameserver              10.96.0.10
search default.svc.cluster.local svc.cluster.local cluster.local
```

```
10-244-1-5      10.244.1.5
10-244-2-5      10.244.2.5
web-service     10.107.37.188
```



10.244.1.5

test

10.107.37.188

web-service

10.244.2.5

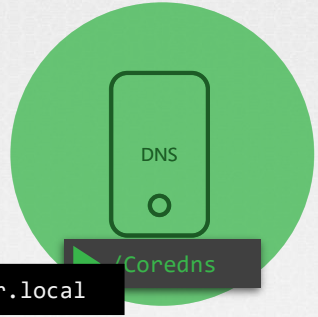
web

```
host web-service
web-service.default.svc.cluster.local has address 10.97.206.196
```

```
host web-service.default
web-service.default.svc.cluster.local has address 10.97.206.196
```

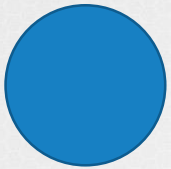
```
host web-service.default.svc
web-service.default.svc.cluster.local has address 10.97.206.196
```

CoreDNS




```
cat /etc/resolv.conf
nameserver              10.96.0.10
search default.svc.cluster.local svc.cluster.local cluster.local
```

```
10-244-1-5      10.244.1.5
10-244-2-5      10.244.2.5
web-service     10.107.37.188
```



10.244.1.5

test

10.107.37.188

web-service

10.244.2.5

web

```
host web-service
web-service.default.svc.cluster.local has address 10.97.206.196
```

```
host 10-244-2-5
Host 10-244-2-5 not found: 3(NXDOMAIN)
```

```
host 10-244-2-5.default.pod.cluster.local
10-244-2-5.default.pod.cluster.local has address 10.244.2.5
```