



KUBERNETES NETWORKING AND THE OUTSIDE WORLD

A STORY ABOUT HOW K8S CHATS WITH ITS FRIENDS

Laurent CORBES ([Enix](#)) (@lcaflc)



WHO'S ENIX?

A TEAM OF EXPERTS WHO CAN HELP YOU WITH:

- Container Orchestration
(consulting, training, managed Kubernetes hosting)
- Network
(our teams have built CDNs and dark fiber networks)
- Virtualization
(we were already selling Xen VMs in 2005)
- Hosting
(let's Terraform your OpenStack)



OUTLINE

- K8S networking model
- Custom Integration
- Kube-Router



K8S NETWORKING MODEL

- direct containers and nodes communication
- Containers see their own IP
- IP per Pod
- Cluster network



POD TO POD NETWORK COMMUNICATION:

- Plugin driven
- Multiple providers
- Almost plug and play



On all setups there is an "*easy*" solution.

- Weave Net
- Flannel
- Calico



EXTERNAL NETWORK COMMUNICATION:

- Inbound: External to K8s Services
- Outbound: Pods to external
- External to Pods (Why not !)



Inbound

- Services driven
- ClusterIP
- NodePort



Outbound

- SNAT
- Routing
- CNI integration



Standard modules not sufficient
Need some extra integration



SUPER GLUE



CLOUD PROVIDERS WORLD

- K8s as a Service
- CNI driver
- Services load balancer



ON PREMISE SUBWORLD

DiY



OpenStack

The Clone Wars

- Integration standard
- Neutron LBaaS
- Layer2 networking



Self made Load Balancer

No Pain, No Gain

- Time consuming
- Simple load balancer + NodePort
- Dynamic with K8s API
- Ingress Controller



Kube-Router

Old pipes give sweetest smoke

- <https://kube-router.io/>
- BGP routing
- IPVS loadbalancer

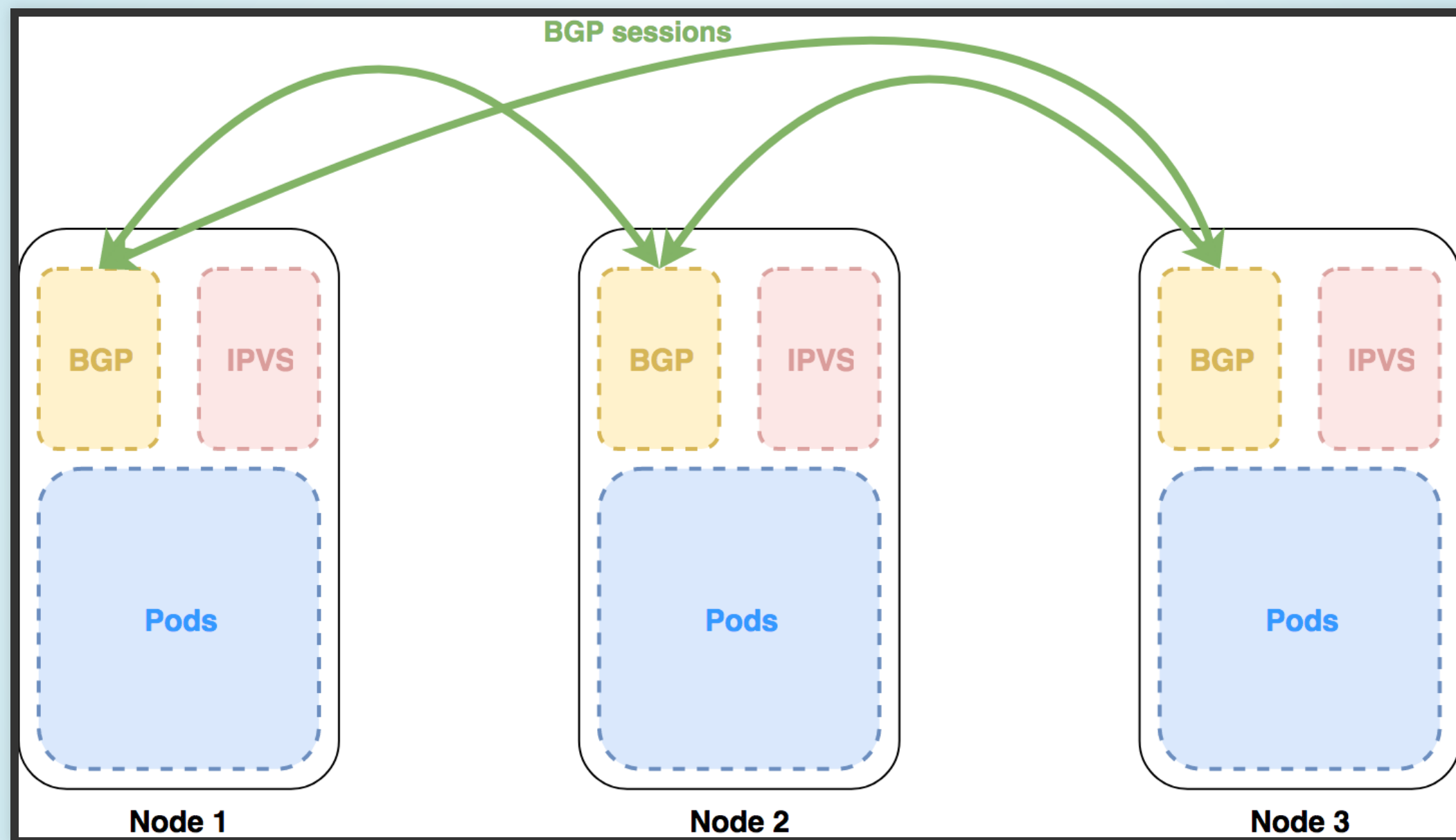


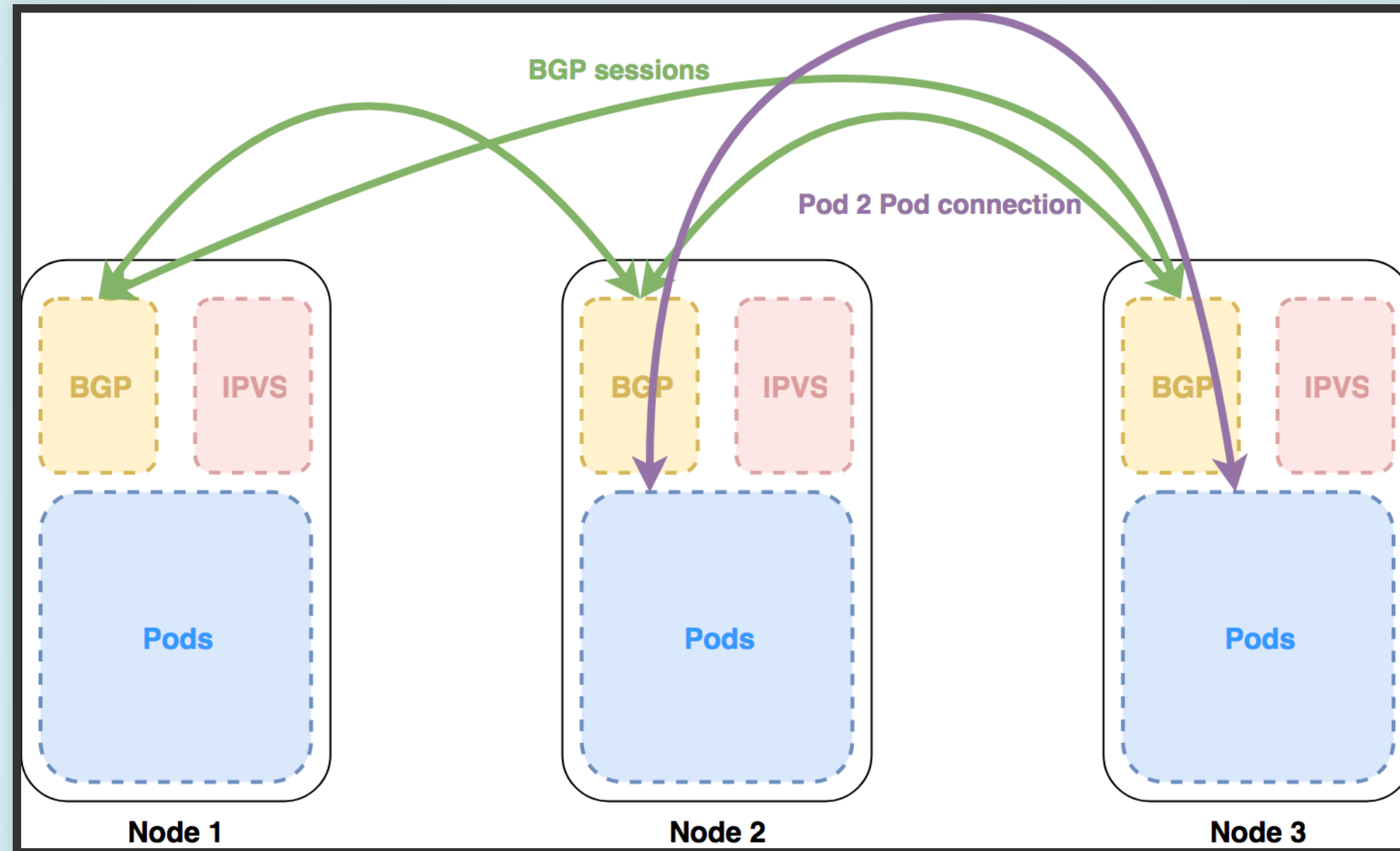
KUBE-ROUTER



POD TO POD NETWORKING

- Fully Dynamic
- Fully meshed
- No NAT
- Network Policy

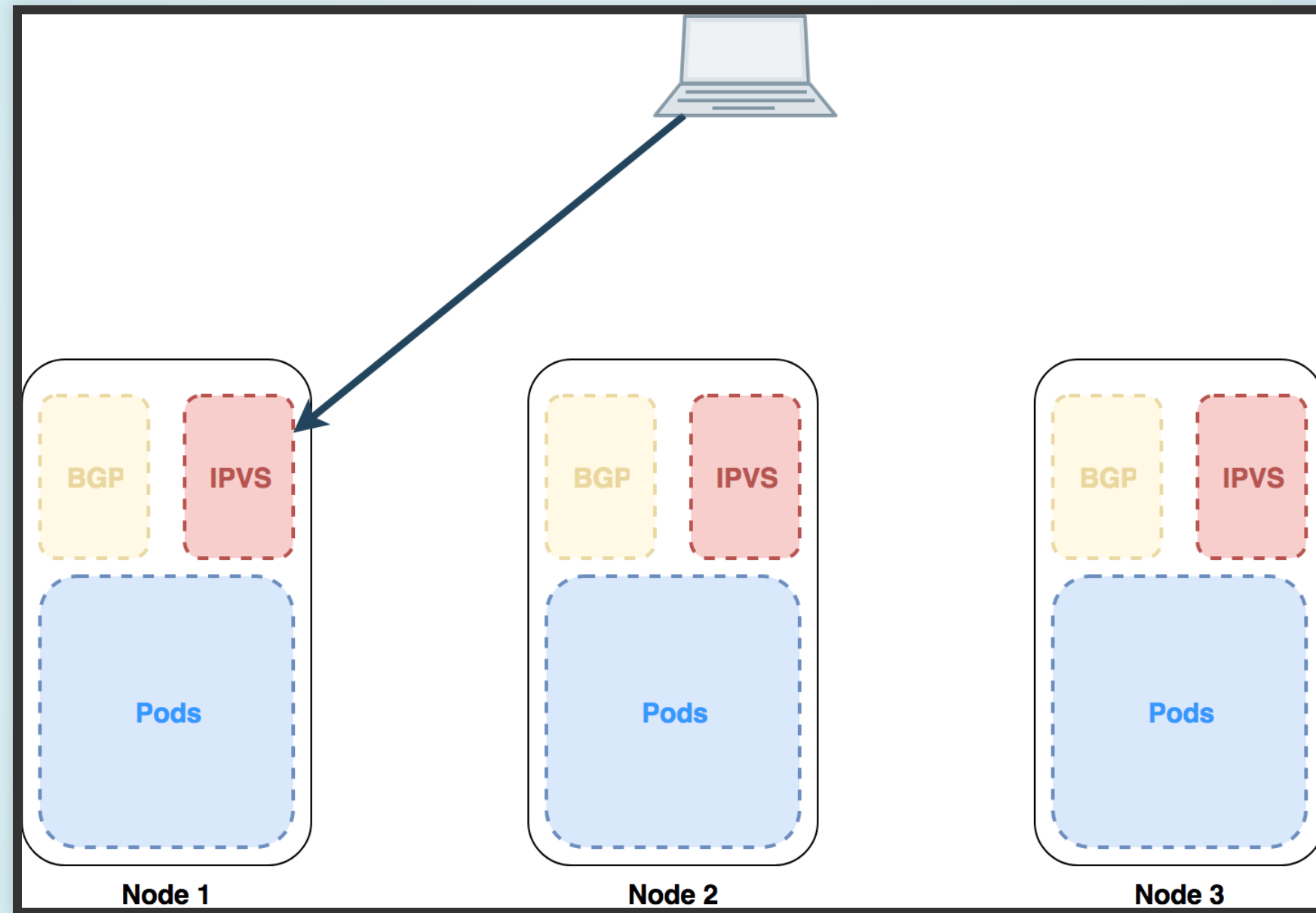


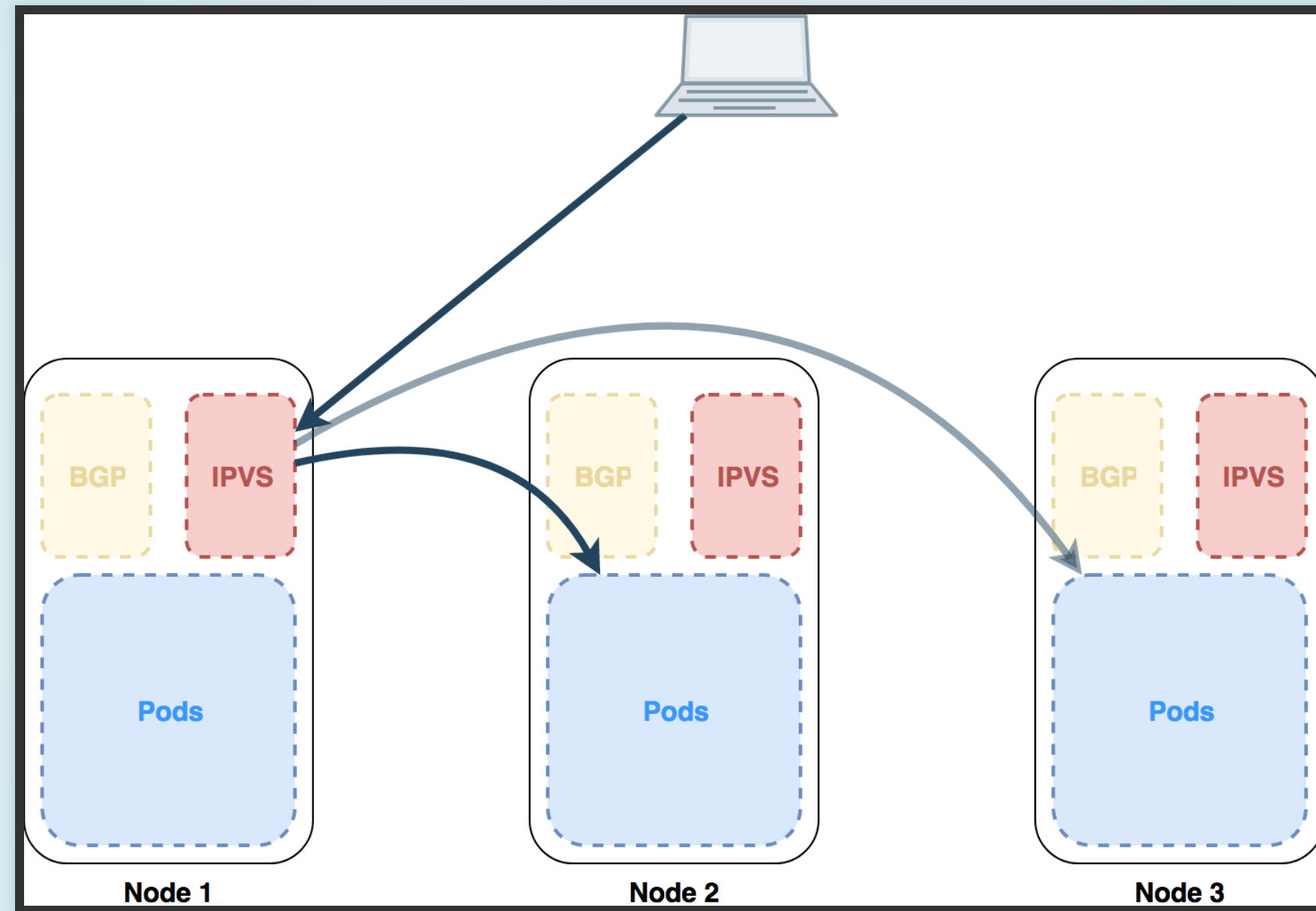


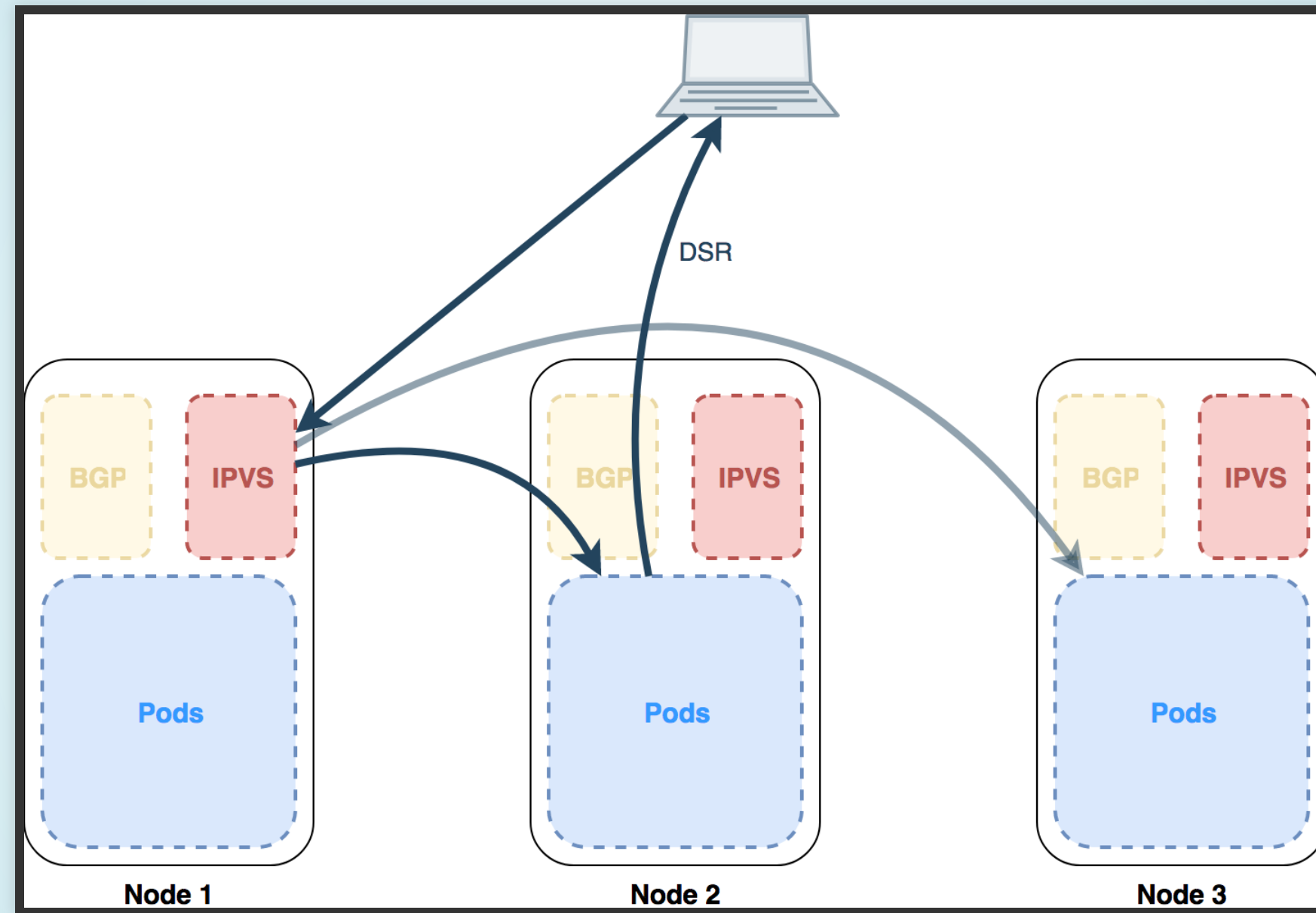


SERVICES

- Dynamic Loadbalancing
- L4 TCP/UDP
- DSR support



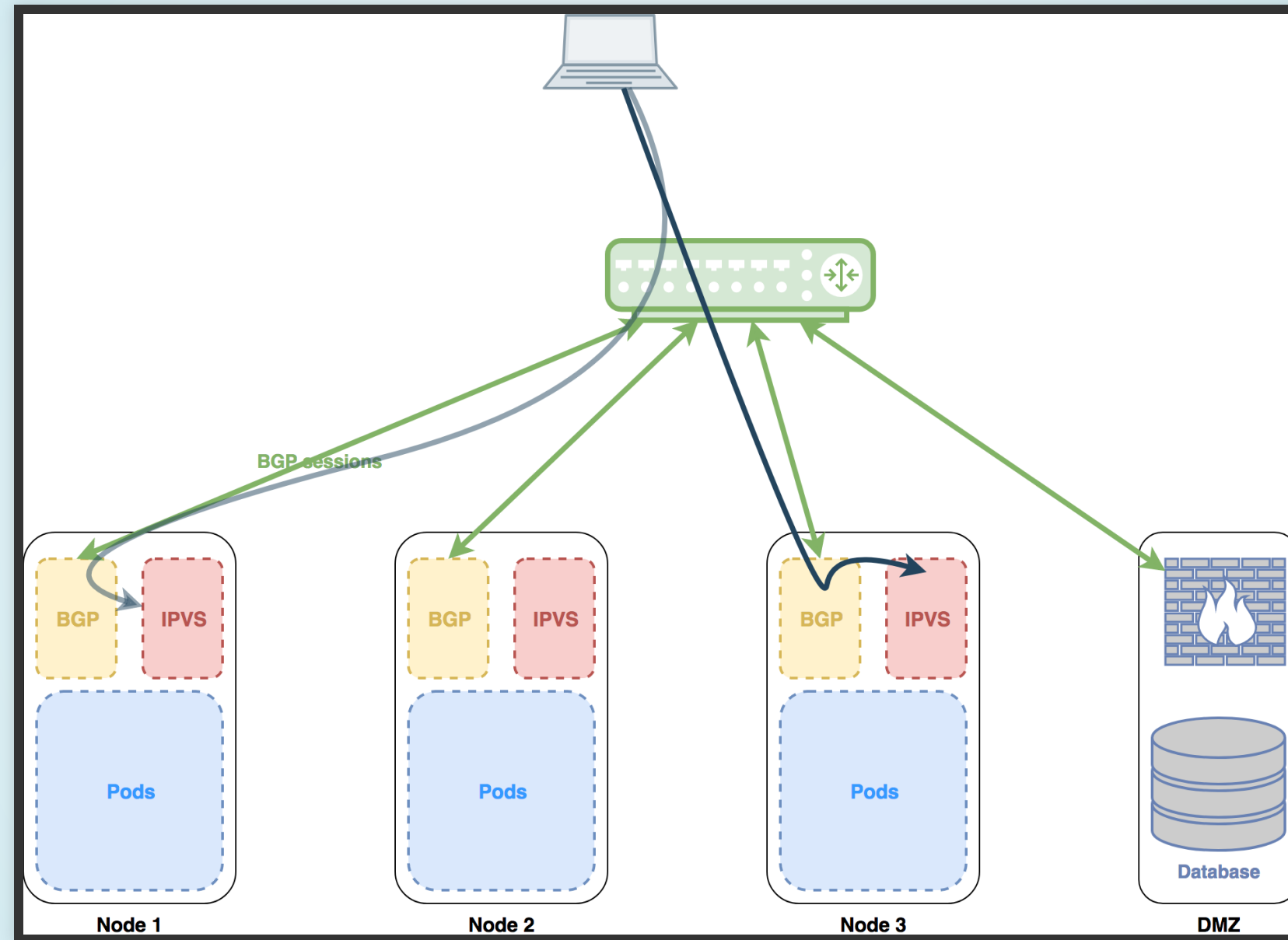


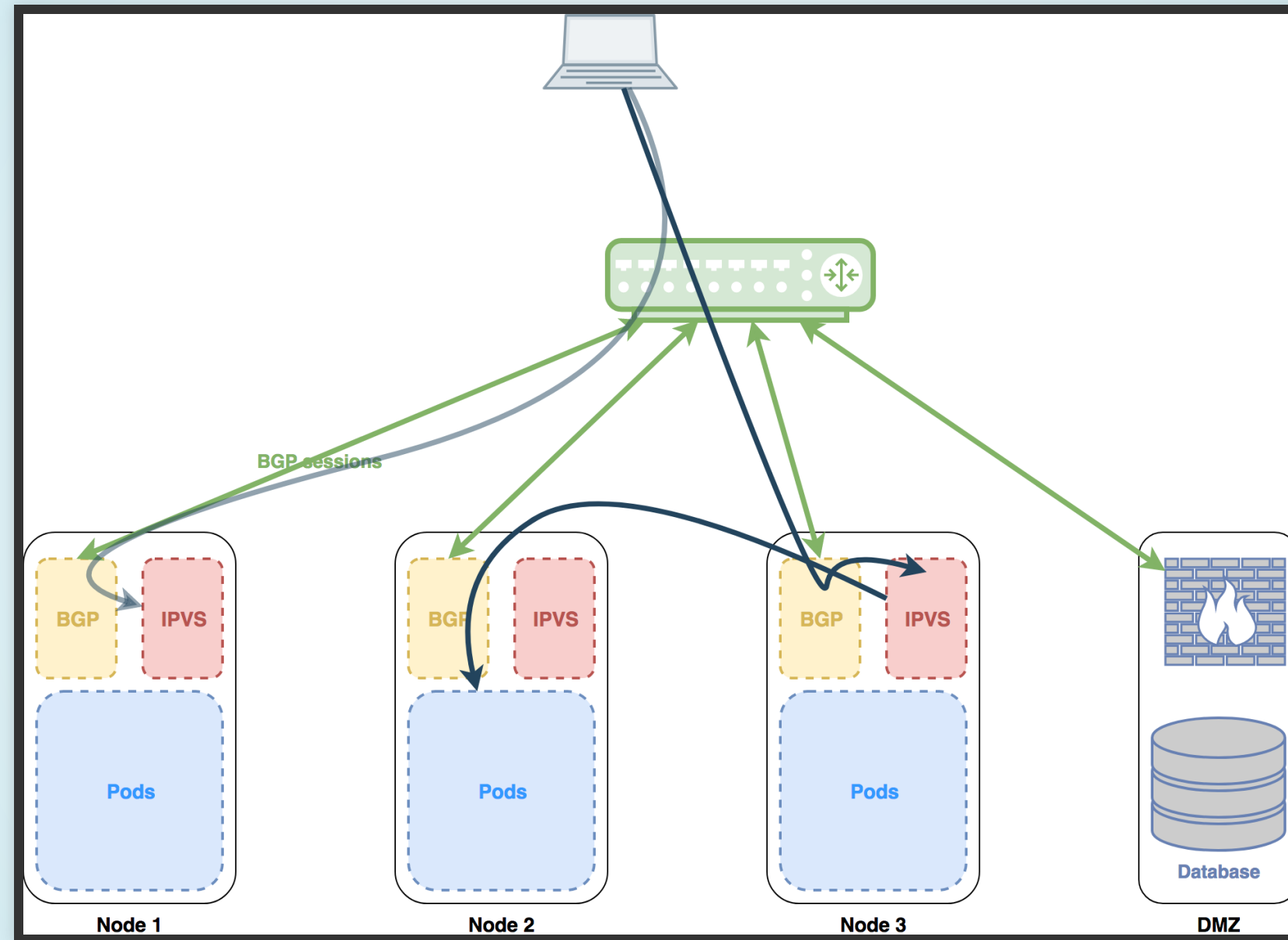


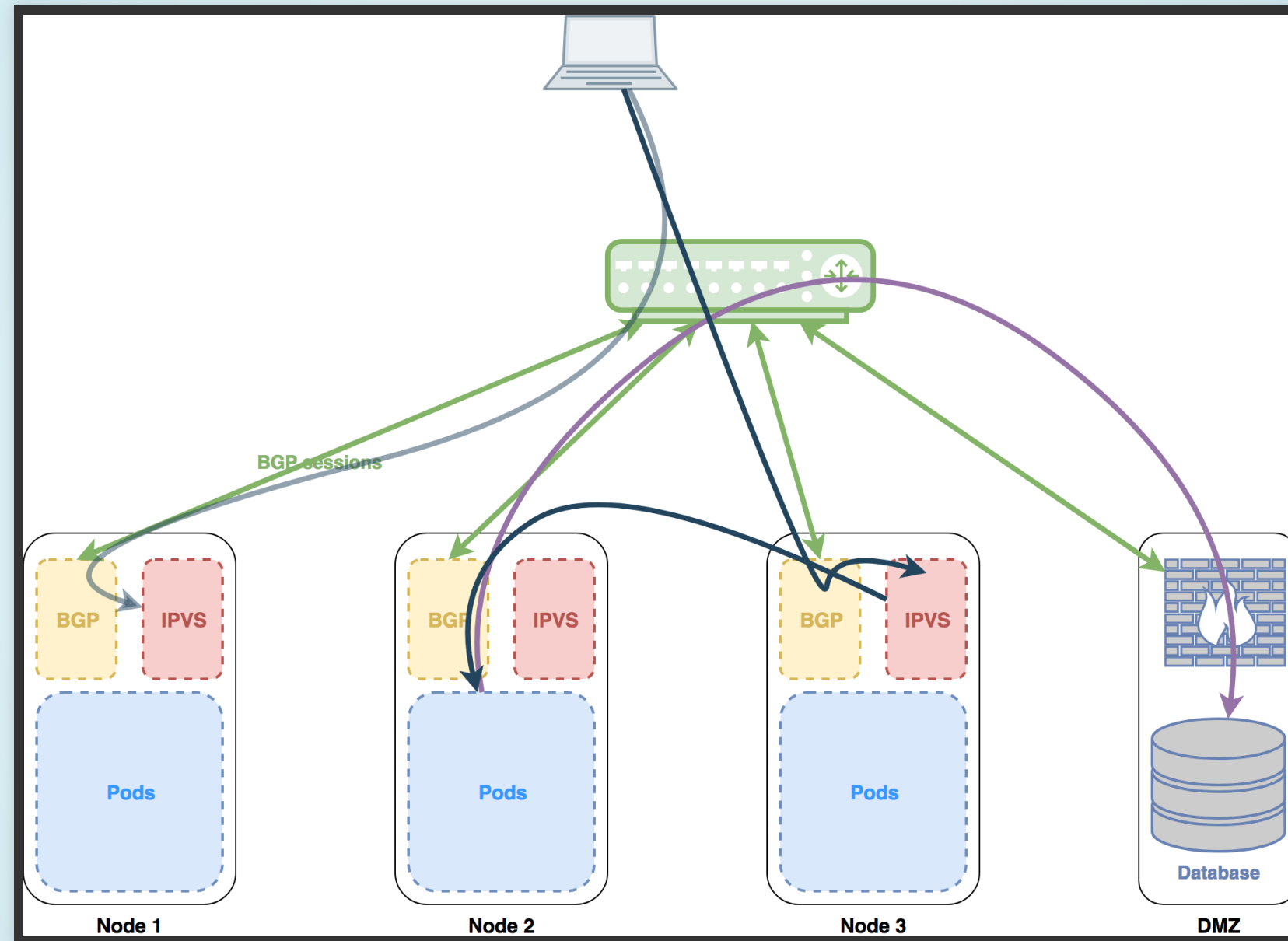


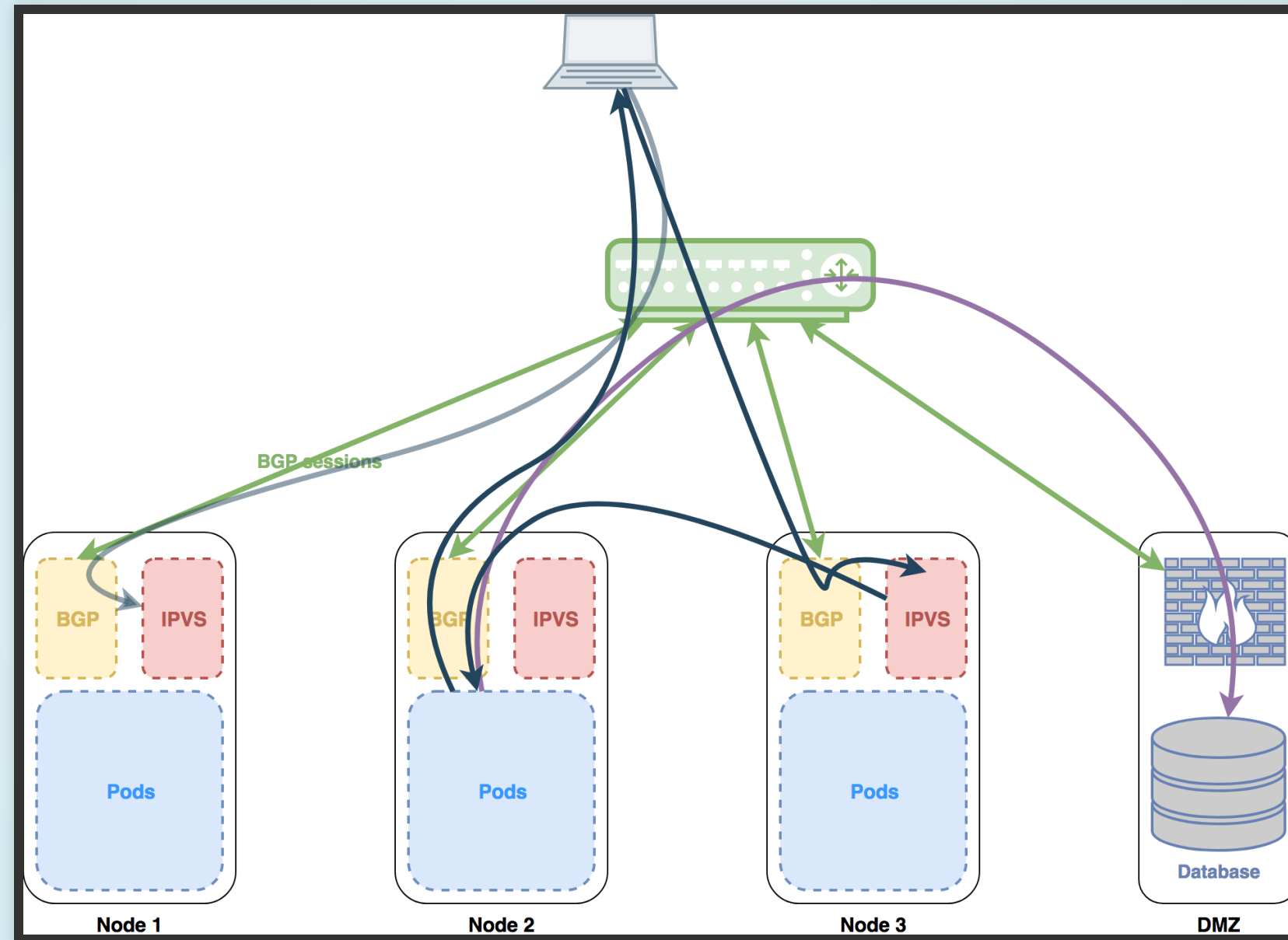
BGP ADVERTISEMENT

- Any BGP router support
- Cluster network and pod CIDRs
- Services ClusterIP / External IP
- ECMP











THIS IS THE END

- On cloud is easy
- But on premise is possible



FORMATION KUBERNETES

Enix propose une formation *Déployer ses applications avec Kubernetes*.

17/18 et 20/21 septembre 2018 à Paris

<https://enix.io/fr/services/formation/deployer-ses-applications-avec-kubernetes/>

Contact: formation@enix.io