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

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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

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SUPER GLUE

CLOUD PROVIDERS WORLD

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

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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

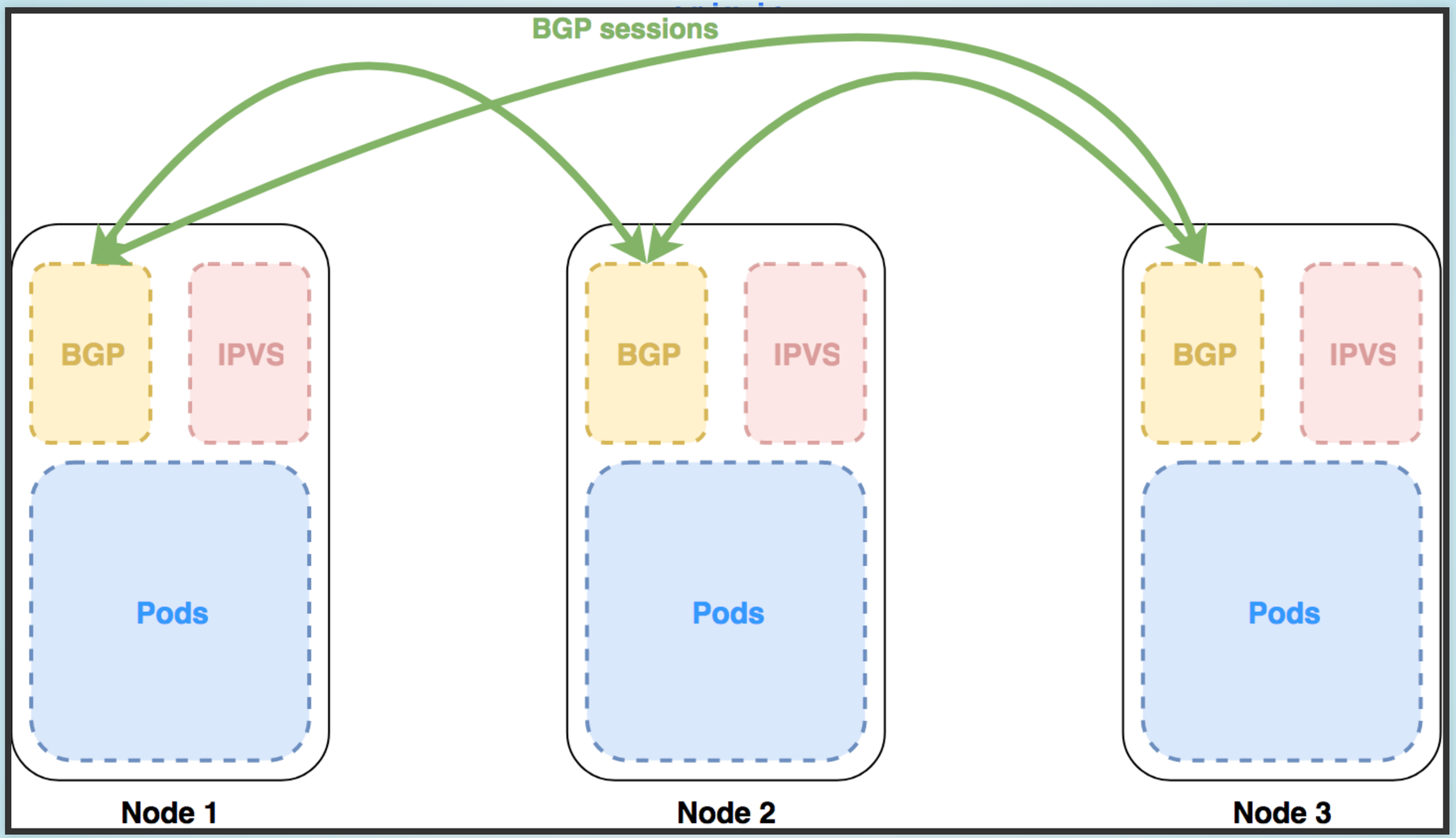
Old pipes give sweetest smoke

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

KUBE-ROUTER

POD TO POD NETWORKING

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


BGP sessions
BGP
IPVS
Pods
BGP
IPVS
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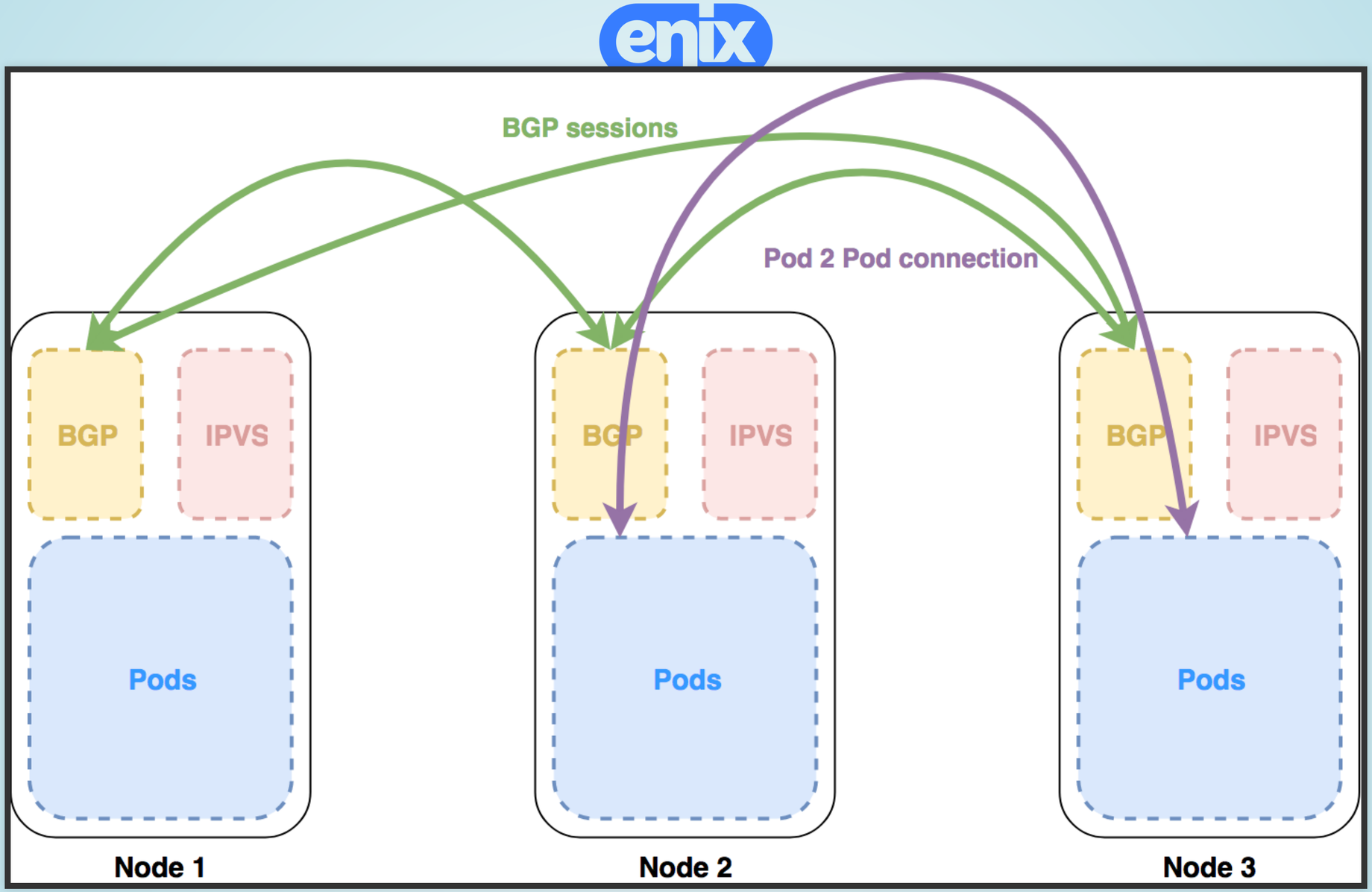
BGP
IPVS
Pods
Node 1
Node 2
Node 3


BGP sessions
Pod 2 Pod connection
BGP
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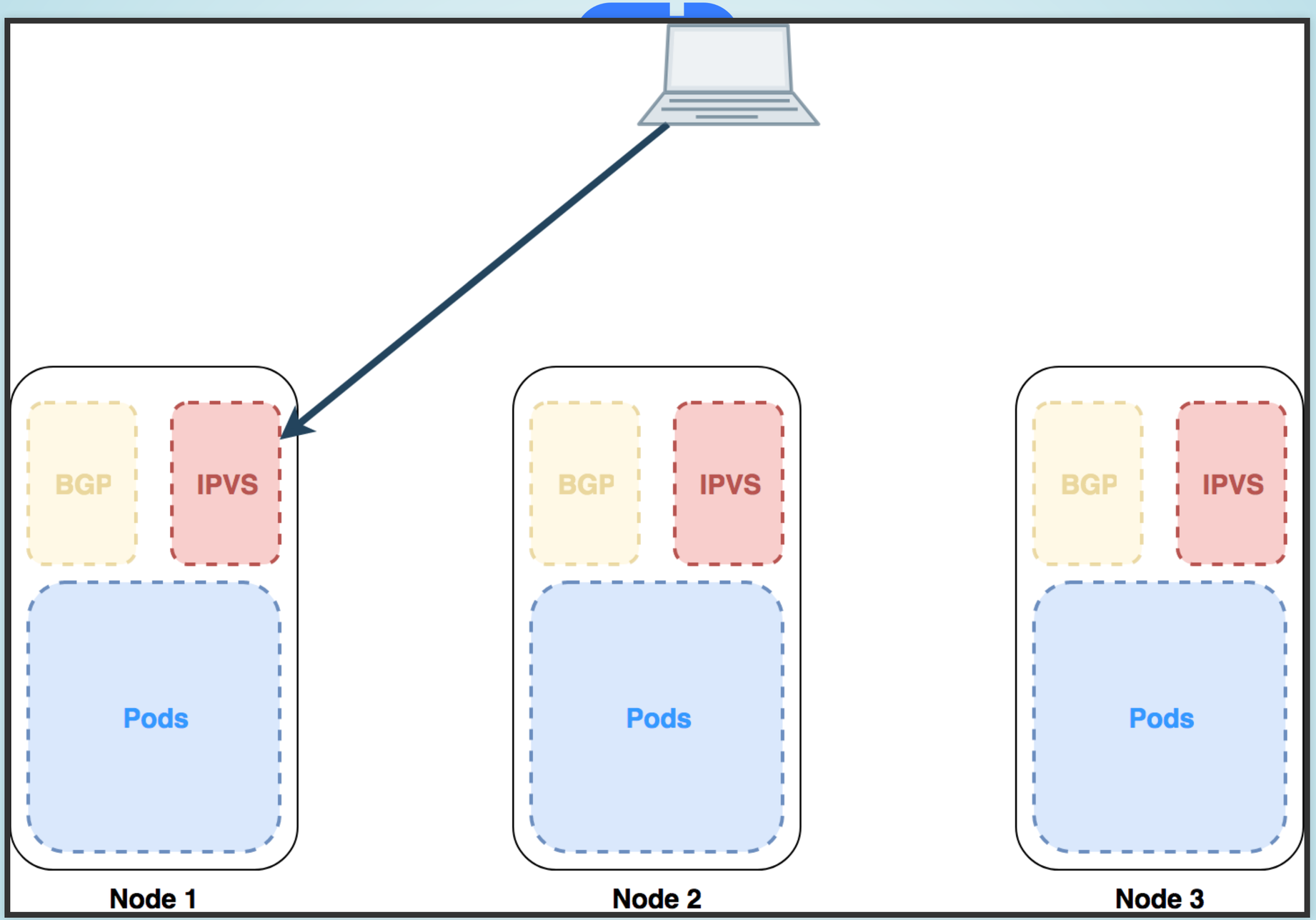
SERVICES

- Dynamic Loadbalancing
- L4 TCP/UDP
- DSR support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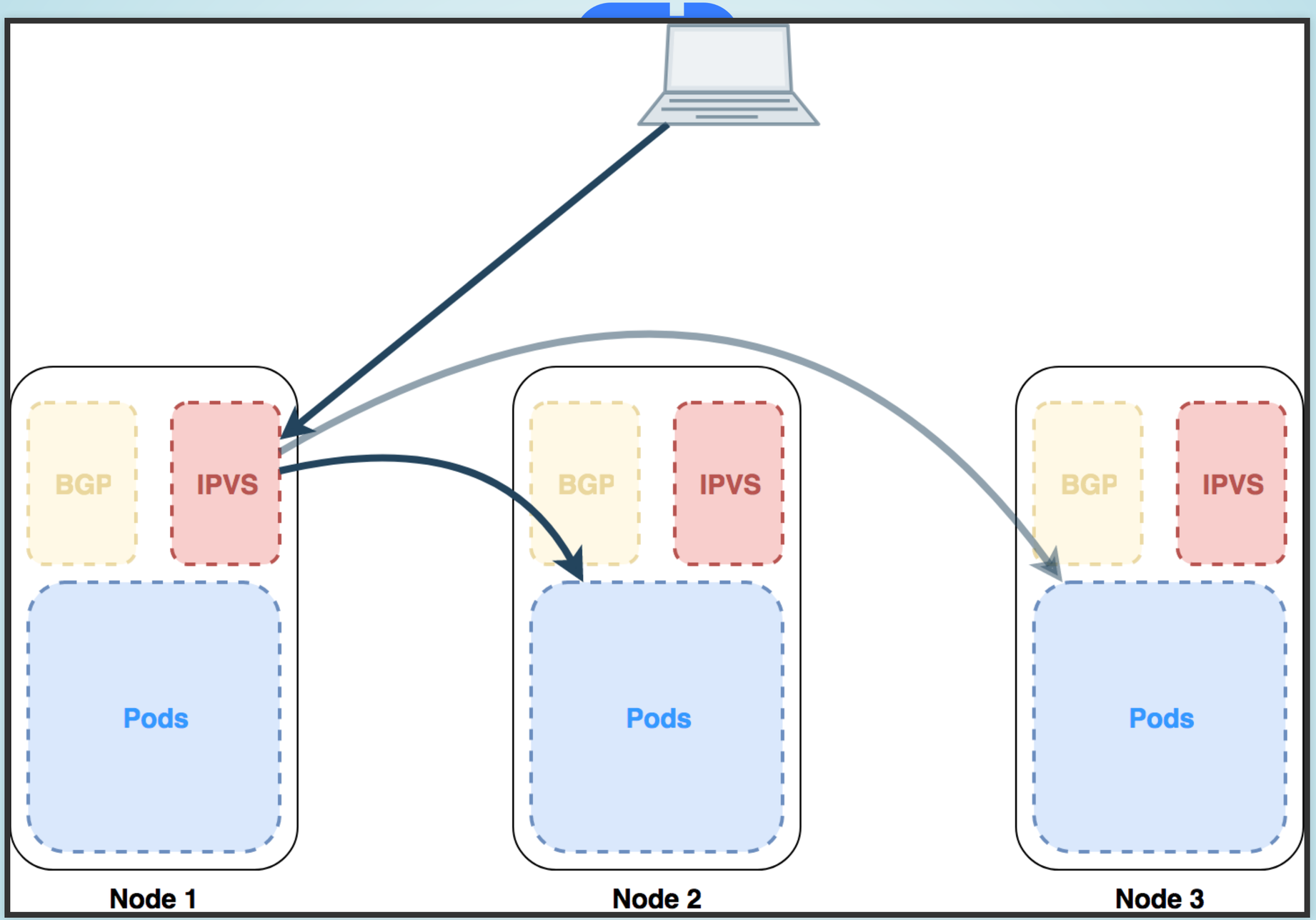
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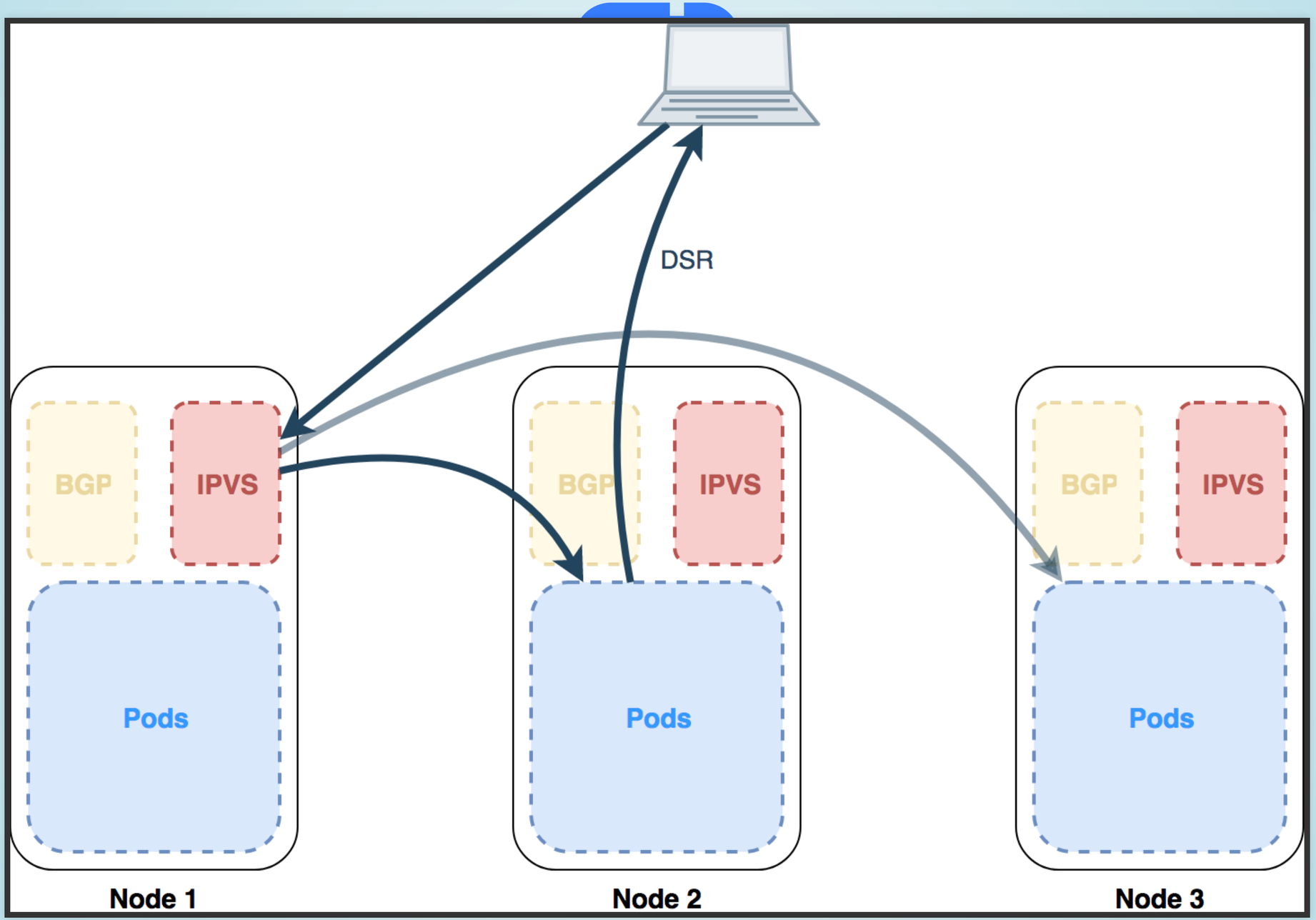
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BGP ADVERTISEMENT

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

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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