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Solving Multi-Cluster Network connectivity with Submariner

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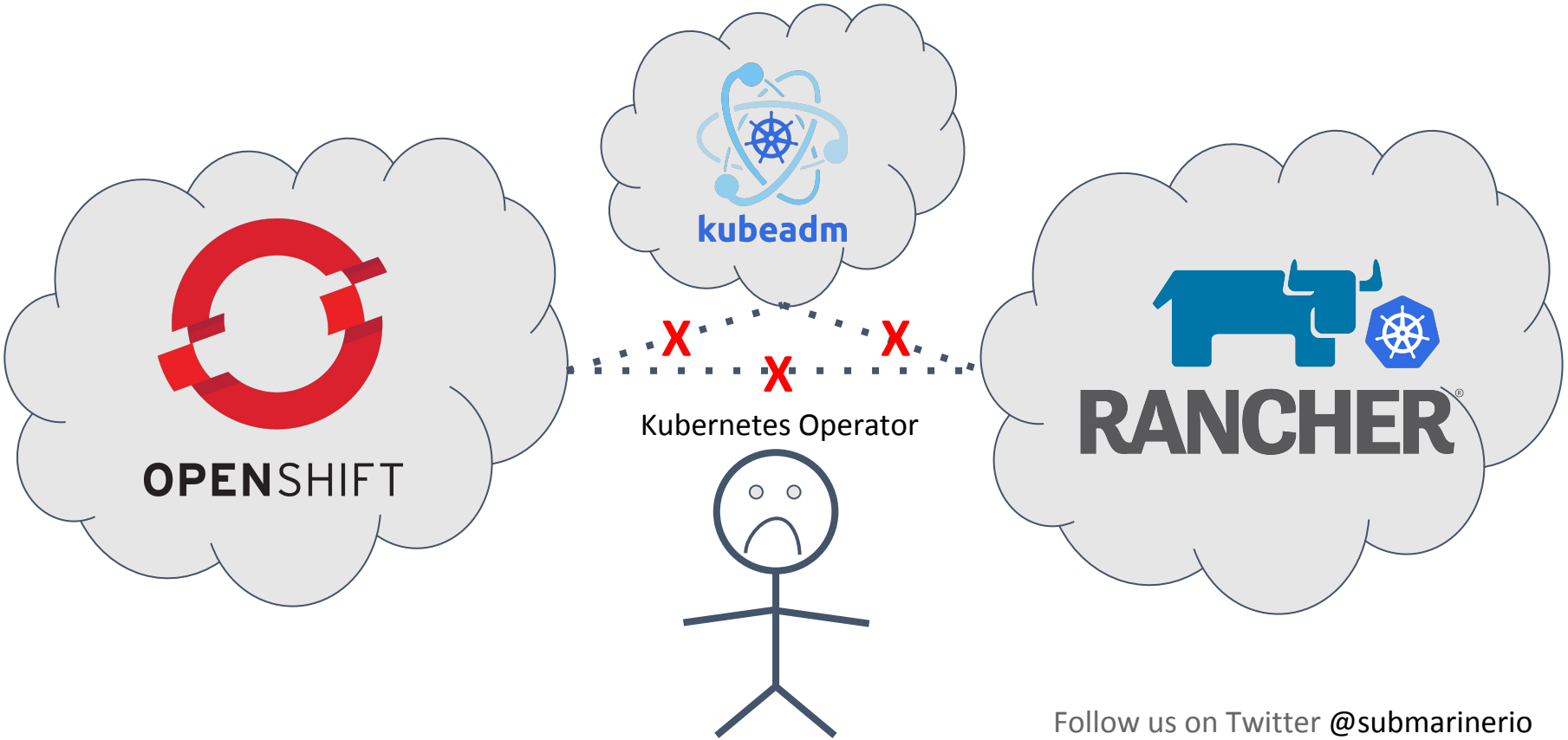
What is Submariner?

Kubernetes Operator

What is Submariner?



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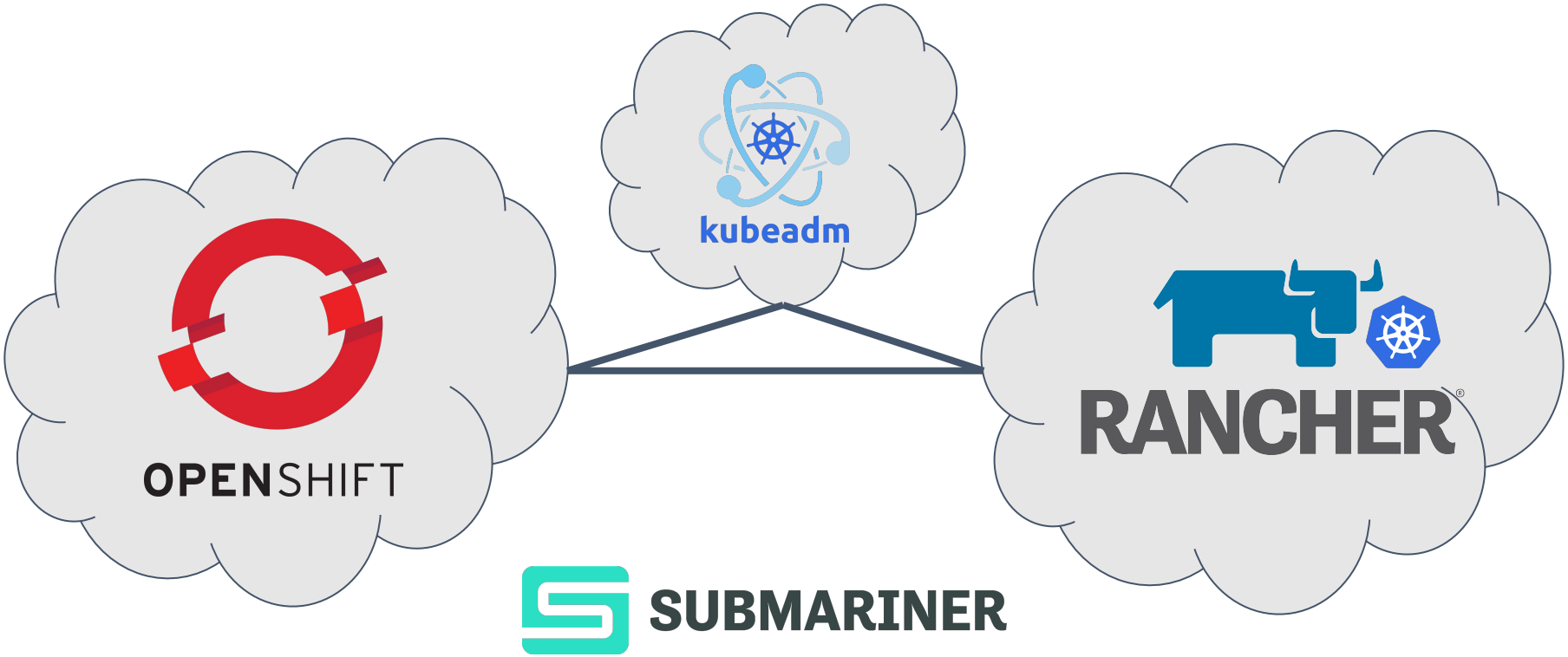
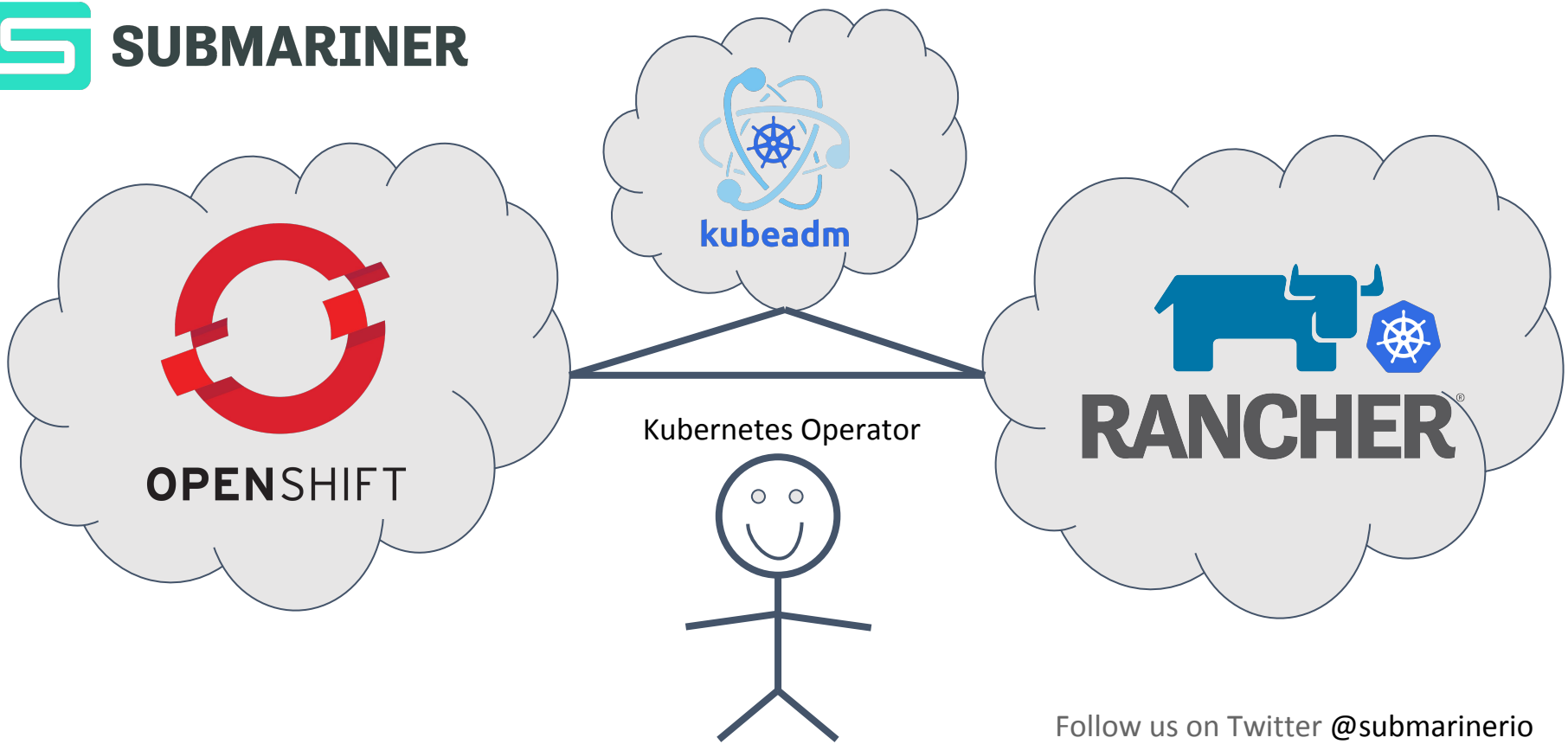


What is Submariner?

SUBMARINER



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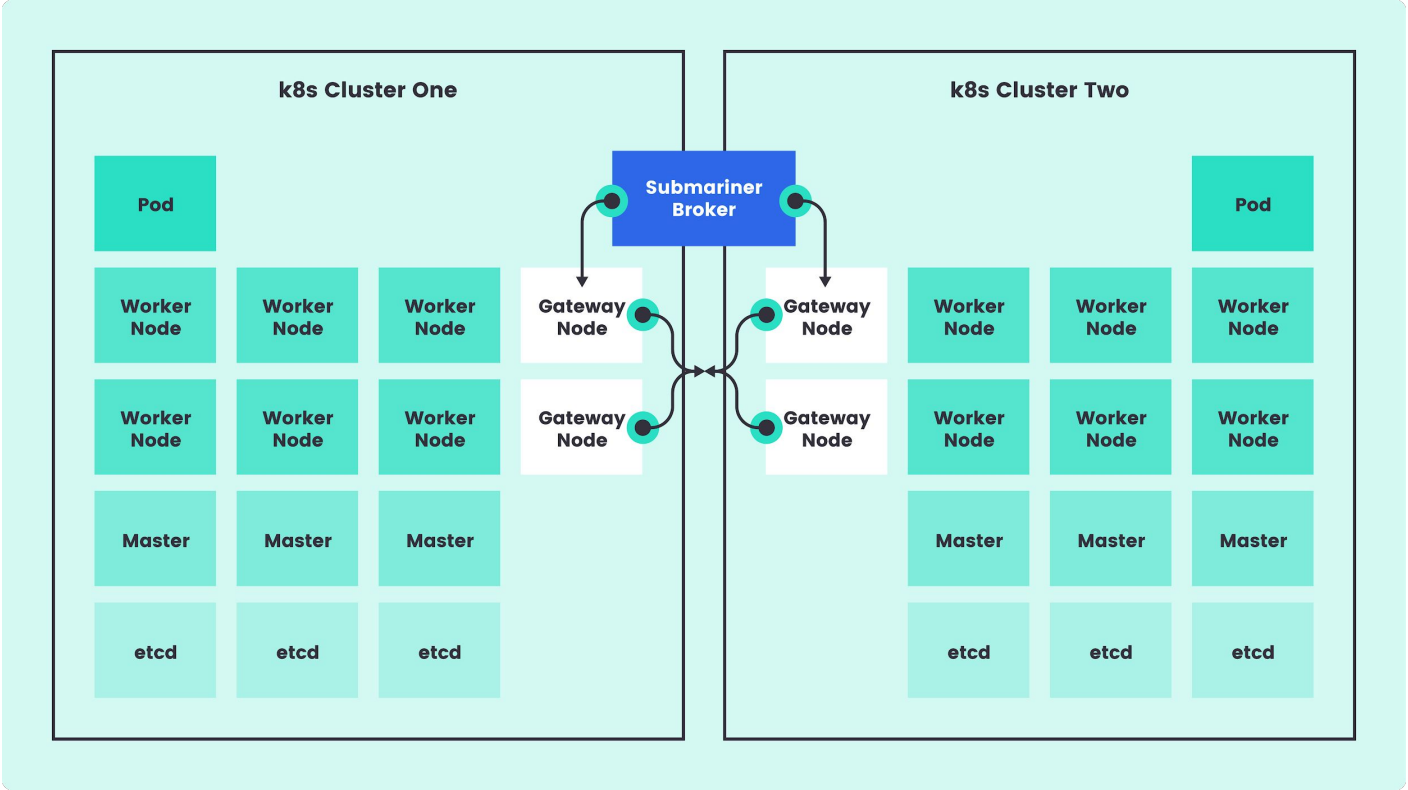
What is Submariner?

- Submariner allows pods to directly communicate between Kubernetes clusters
- Submariner is secure -- it uses establishes IPsec tunnels between clusters
- Submariner is CNI-agnostic, it operates at a layer independent of your network provider

How does it work?



History of Submariner

- Submariner was first conceptualized in 2017
- First prototypes were written in late 2018
- Submariner 0.0.1 was released in March 2019
- Rancher and Red Hat (+ Community) have been collaborating on Submariner to enhance/increase reliability
- Submariner 0.0.3 (current release) was released in November 20, 2019

History of Submariner

Changelog from 0.0.1 to 0.0.3

- Elimination of NAT between clusters
- E2E testing (make e2e status=keep)
- Unit Testing (make test)
- A submariner-operator and subctl were developed

Roadmap

Roadmap

- Support for overlapping IP CIDR ranges
- Service discovery across clusters
- NetworkPolicy support across clusters (experimental)
- Support more network plugins: ovn-kubernetes, “GKE”, etc…
- Status monitoring
- Subctl (more about this when talking about deployment options)

Roadmap (Overlapping CIDRs)

Handling clusters with Overlapping CIDRs

Handling overlapping CIDRs is being developed by the submariner team, the implementation is based on a global overlay CIDR which will be used for colliding clusters.

Roadmap (DNS Discovery)

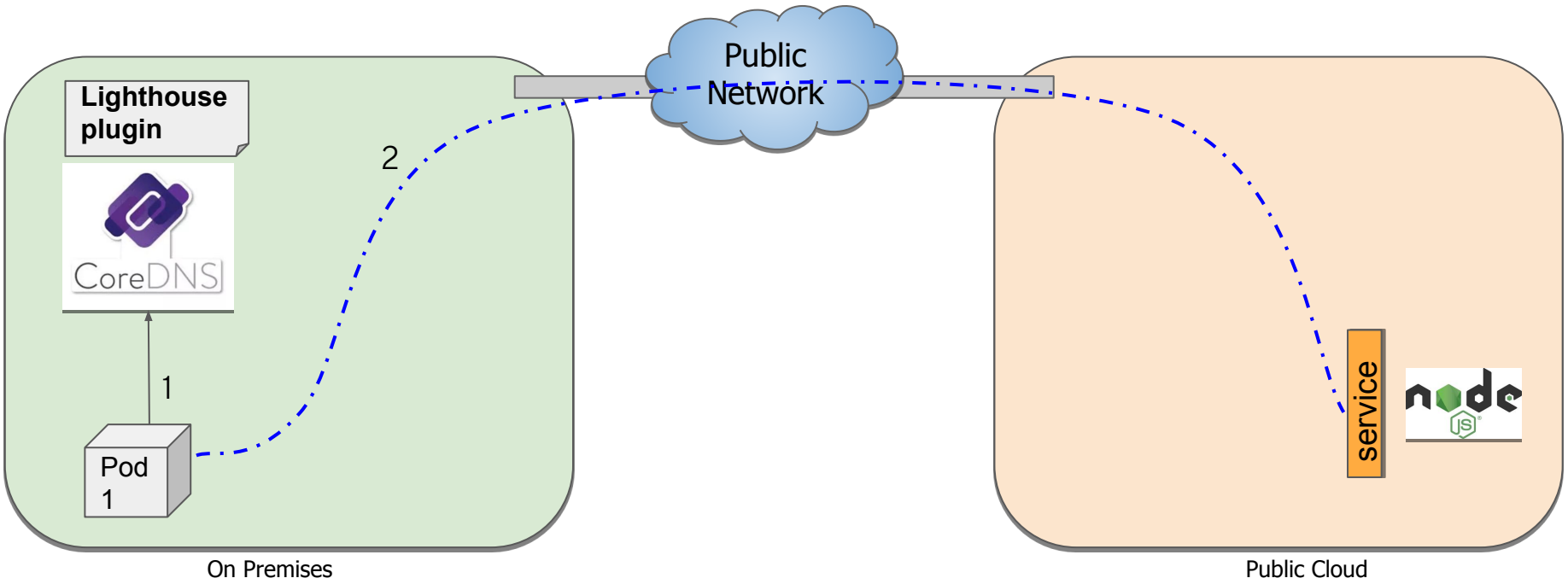
github.com/submariner-io/**lighthouse**

Lighthouse facilitates DNS Service Discovery in multi-cluster connected environments

The idea is that the application does not need to know where the service lives, it accesses local and remote services in the same manner

Roadmap (DNS Discovery)

github.com/submariner.io/**lighthouse**



https://github.com/submariner-io/lighthouse

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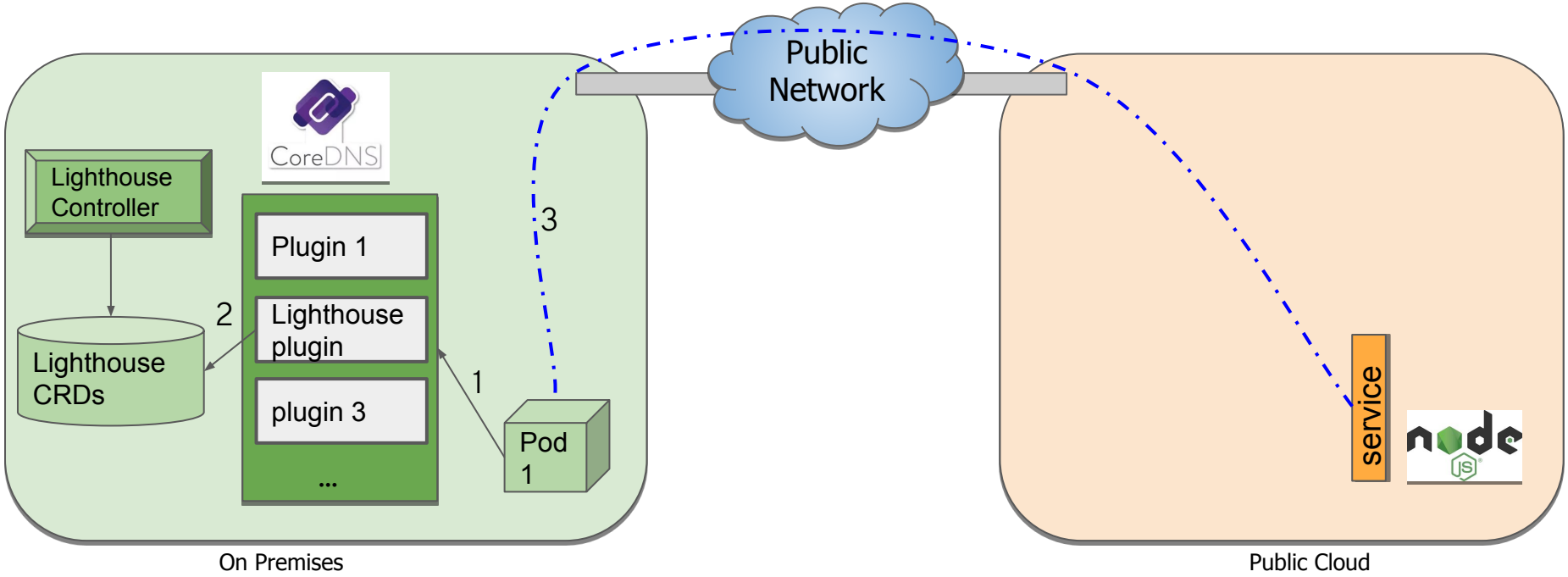
Roadmap (DNS Discovery)

github.com/submariner-io/**lighthouse**



Roadmap (Network Policies)

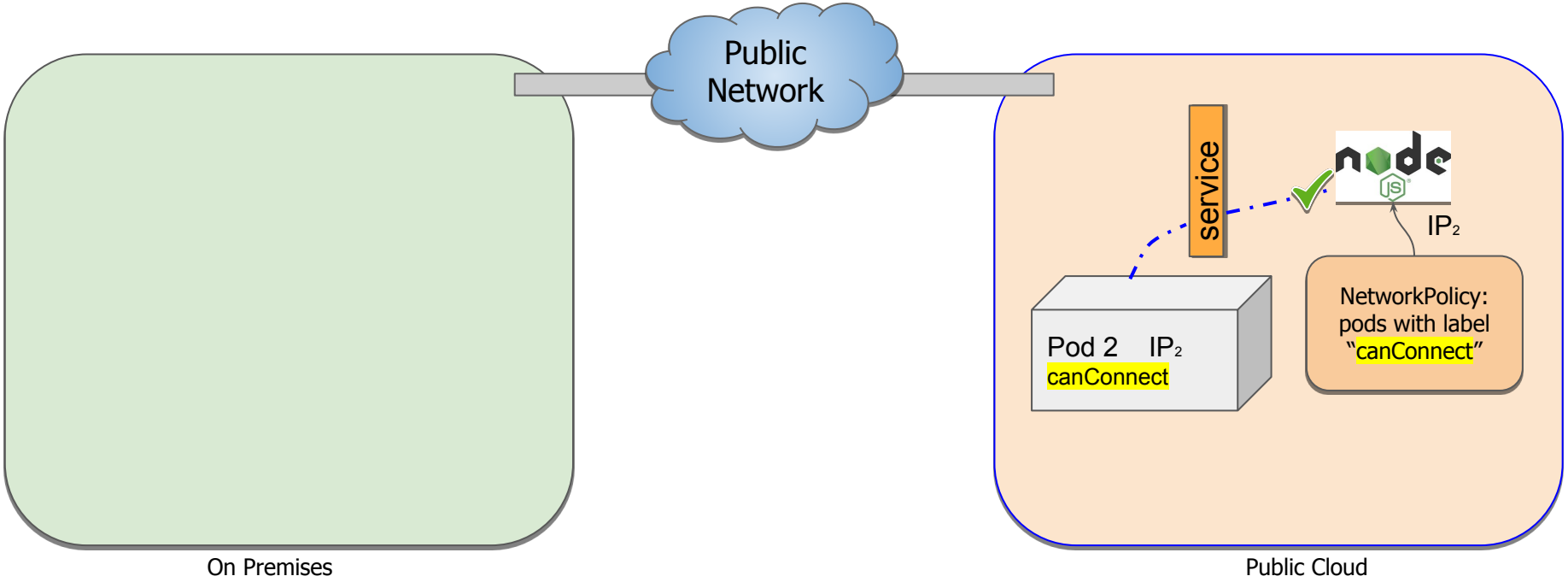
github.com/submariner-io/**coastguard**

Coast Guard facilitates NetworkPolicy functionality in multi-cluster connected environments

Coastguard analyzes Network Policies and applies them on traffic that is originated on remote cluster as if it were local.

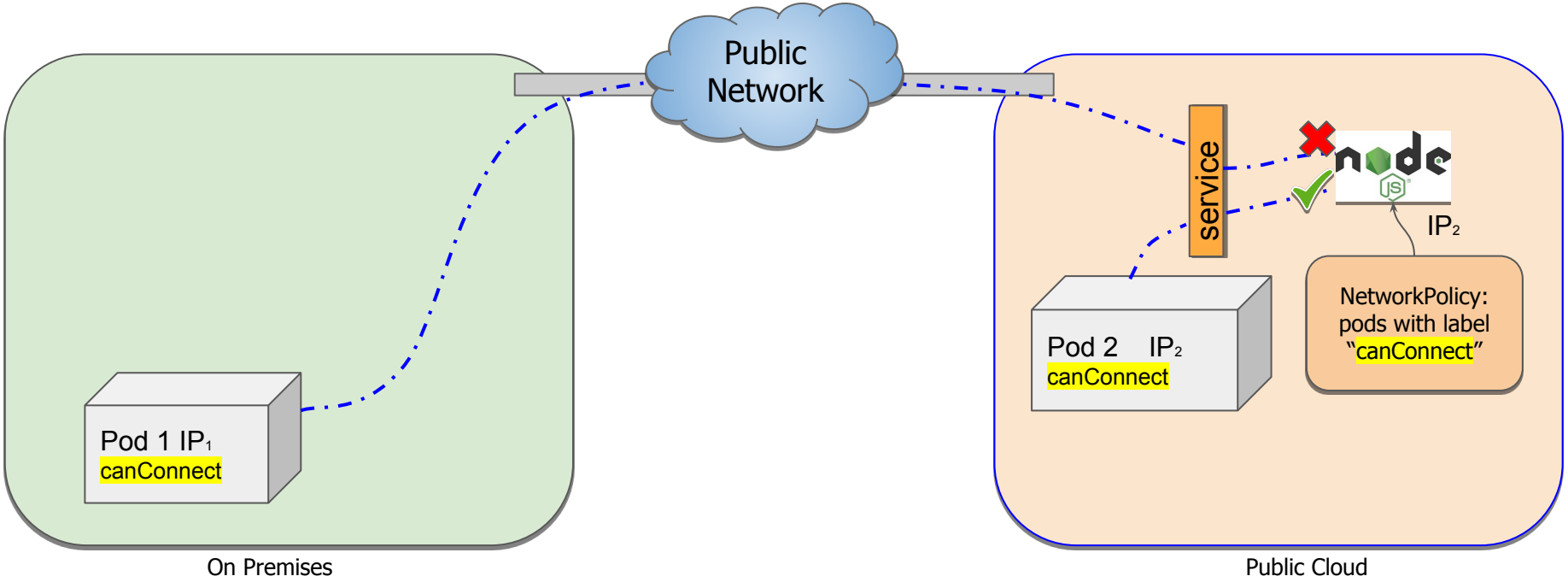
Roadmap (Network policies)

(without coastguard running)



Roadmap (Network policies)

(without coastguard running)



Roadmap (Network policies)

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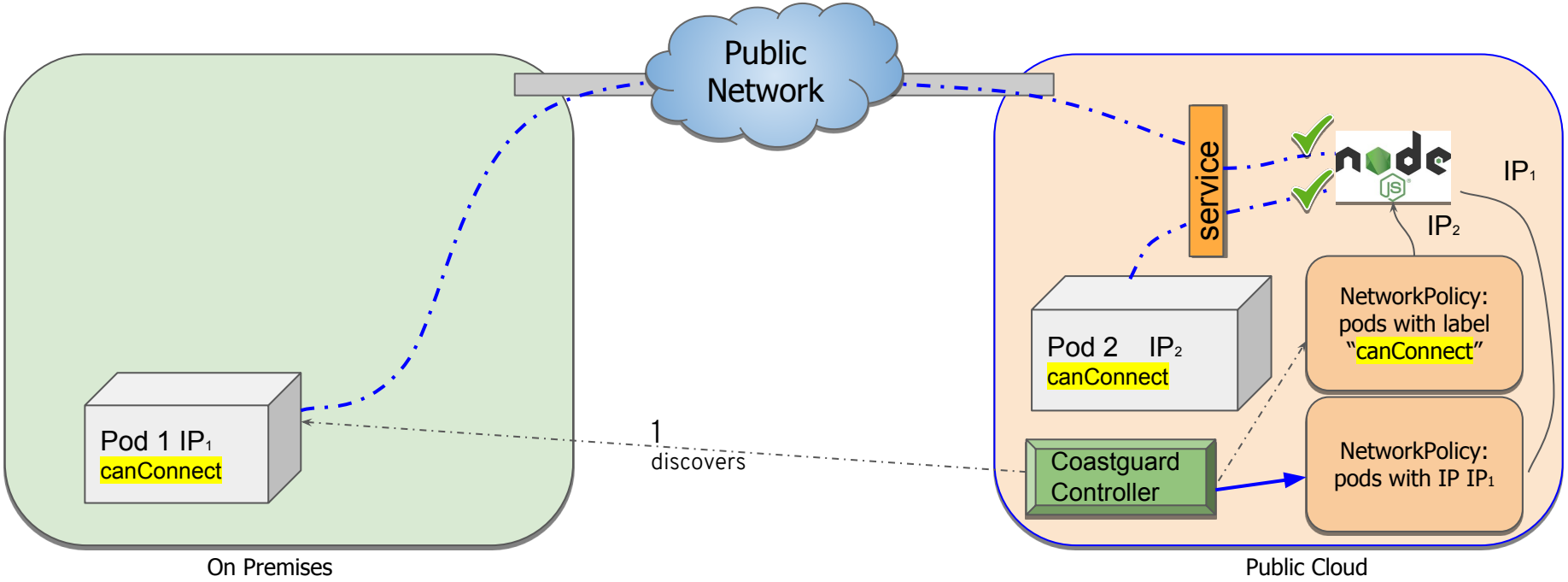


Deployment Options

Deployment Options

- submariner-operator
  - Installed on the cluster manages your submariner deployment and maintenance (upgrades, status, etc.)
- helm
  - https://github.com/submariner-io/submariner-charts
  - helm repo add submariner-latest https://submariner-io.github.io/submariner-charts/charts
- subctl (+ subm-operator)
  - cmdline interface to the operator (install, easy-configuration, status, upgrade…)

subctl Deployment

subctl

```
$ export KUBECONFIG=my-broker-cluster/kubeconfig

$ subctl deploy-broker    [--no-dataplane]
* Deploying broker
Writing submariner broker data to broker-info.subm
? What is your cluster ID? rancher
* There are 1 labeled nodes in the cluster:
  - subm-a-gw-1
* Deploying the submariner operator
* Created operator namespace: submariner-operator
* Created operator service account and role
* Deployed the operator successfully
* The operator is up and running
* Discovering network details
    Discovered network details:
        Network plugin:  canal-flannel
        ClusterIP CIDRs: []
        Pod CIDRs:       [10.42.0.0/16]
? What's the ClusterIP service CIDR for your cluster? 10.43.0.0/16
* Deploying Submariner
* Submariner is up and running

Your broker is ready, use broker-info.subm to join other clusters.
```

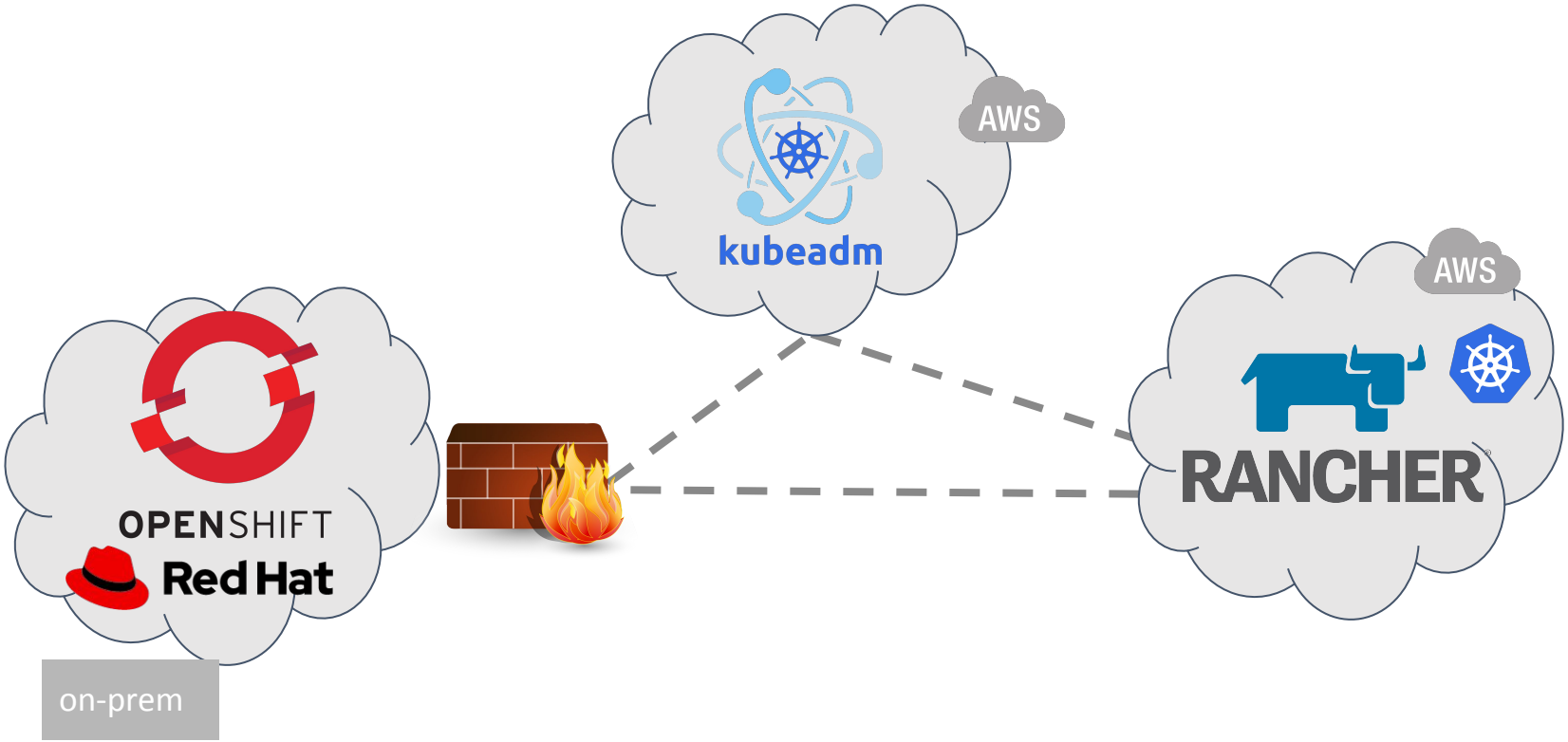
subctl Deployment

subctl

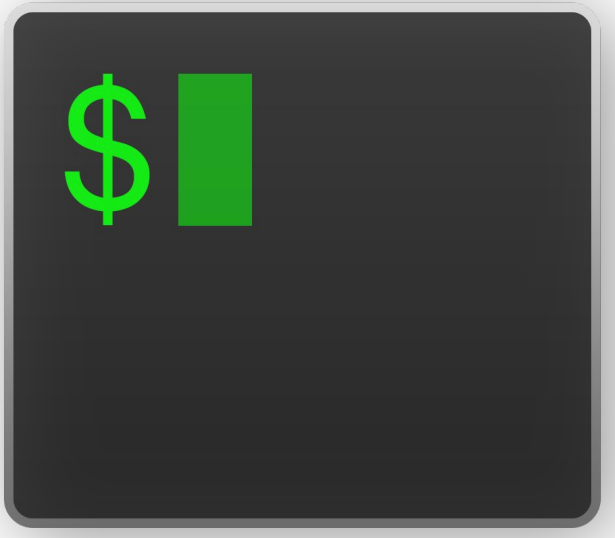
```
$ subctl join --kubeconfig auth/ocp-in-redhat broker-info.subm --clusterid in-redhat-ocp
* broker-info.subm says broker is at: https://54.185.131.224:6443
* There are 1 labeled nodes in the cluster:
  - majopela-cl1-mlwr6-worker-zs691
* Deploying the submariner operator
* Created operator namespace: submariner-operator
* Created operator service account and role
* Deployed the operator successfully
* The operator is up and running
* Discovering network details
    Discovered network details:
        Network plugin:  OpenShift
        ClusterIP CIDRs: [100.96.0.0/16]
        Pod CIDRs:       [10.252.0.0/14]
* Deploying Submariner
* Submariner is up and running
```

Demo time !

Demo time!



Demo time!



Demo time!

You can get subctl here:
https://github.com/submariner-io/submariner-operator/releases/tag/v0.0.2

Or just checkout the submariner-operator source code and run “make bin/subctl”

Community

- Are you interested in submariner as an operator?

  Join our user mailing list and ping us!

- Are you interested in contributing?

  We run a weekly meeting at on Tuesdays at 8 AM PST/5 PM GMT+1 -- Join the mailing list and an invite will be sent to you

  Check out our repositories and open a PR at https://github.com/submariner-io

Community, Q&A

http://bit.ly/submariner-users

Thank you :-)

http://bit.ly/submariner-dev

Follow us on Twitter: @submarinerio

http://github.com/submariner-io

SUBMARINER

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Time tracking:

- 2.0 min. What's submariner?
- 1.5min. History of submariner
- 0.5min. Roadmap list
  - 0.5min Overlapping IPs
  - 1.5min. Lighthouse
  - 2.0min. Coastguard
- 2.5min deployment options
- 7.0 min Demo

Total: 18min
Available for Q&A: 30-18 = 12min