

# Debugging Services on Kubernetes with Linkerd

**Thomas Rampelberg**

Software Engineer

@grampelberg

# About me

Thomas Rampelberg

Software Engineer at Buoyant

Twitter: @grampelberg



@grampelberg

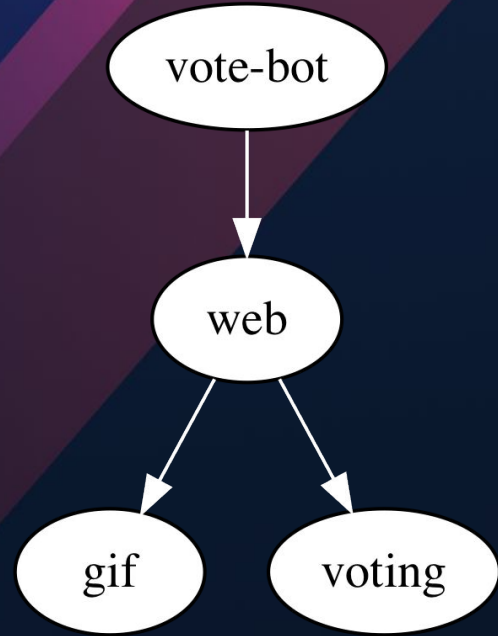
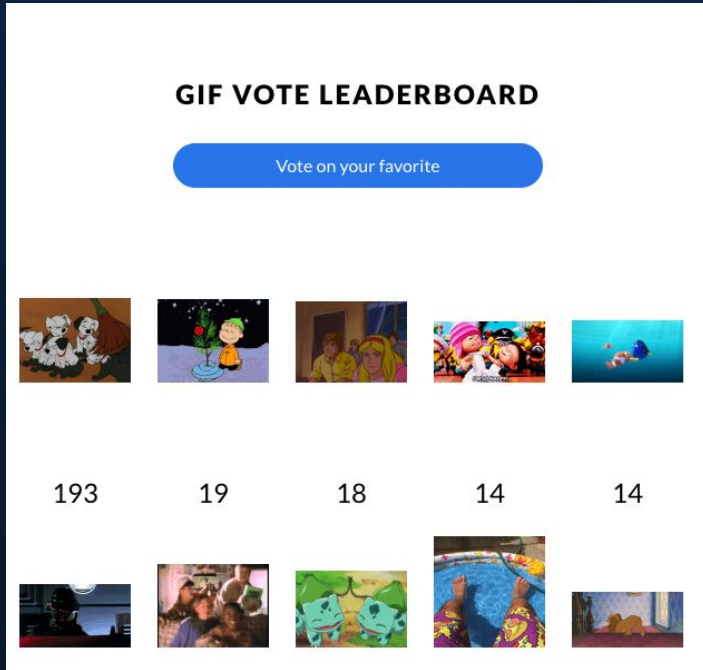


# KataKoda

<http://bit.ly/linkerd-tutorial>

@grampelberg

<https://nodevoto.buoyant.io/>



<http://bit.ly/linkerd-tutorial>

@grampelberg



## GIF VOTE

Tap to vote for your favorite gif below

View the leaderboard



# Debugging: Live!

<http://bit.ly/linkerd-tutorial>

@grampelberg



**Honest Status Page**

@honest\_update

Follow



We replaced our monolith with micro services  
so that every outage could be more like a  
murder mystery.

4:10 PM - 7 Oct 2015

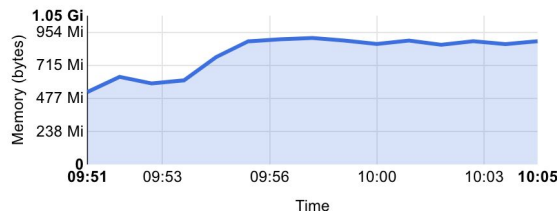
# What could be going wrong?

- ✓ Process is running
- ✓ Logs look good
- ✓ Ping is working

CPU usage



Memory usage ⓘ





# Monitoring is tedious

- Add some libraries to my code
- Stand up a monitoring solution (prometheus?)
- Figure out how to do dashboards
- Put some dashboards together
- ....
- Profit?

# Linkerd

<http://bit.ly/linkerd-tutorial>

@grampelberg



24+ months in production

2k+ Slack channel members

7,000+ GitHub stars

20m+ DockerHub pulls

80+ contributors

400b+ production requests/mo



credit karma



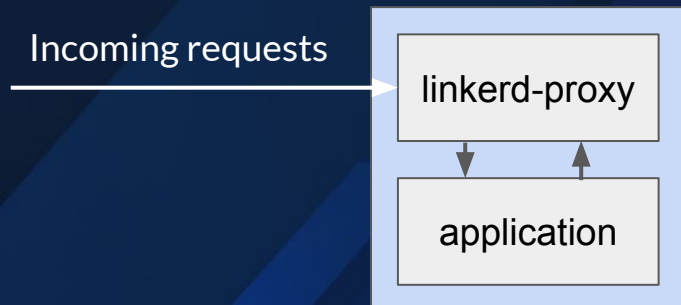
<http://bit.ly/linkerd-tutorial>

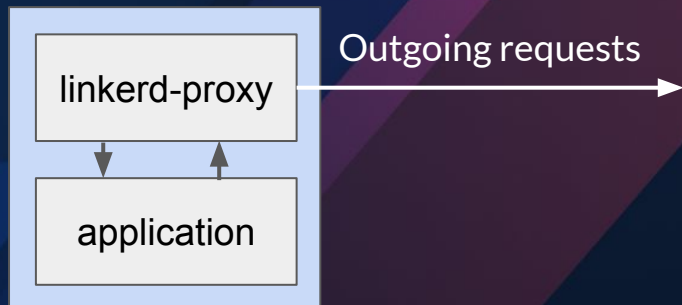
@grampelberg

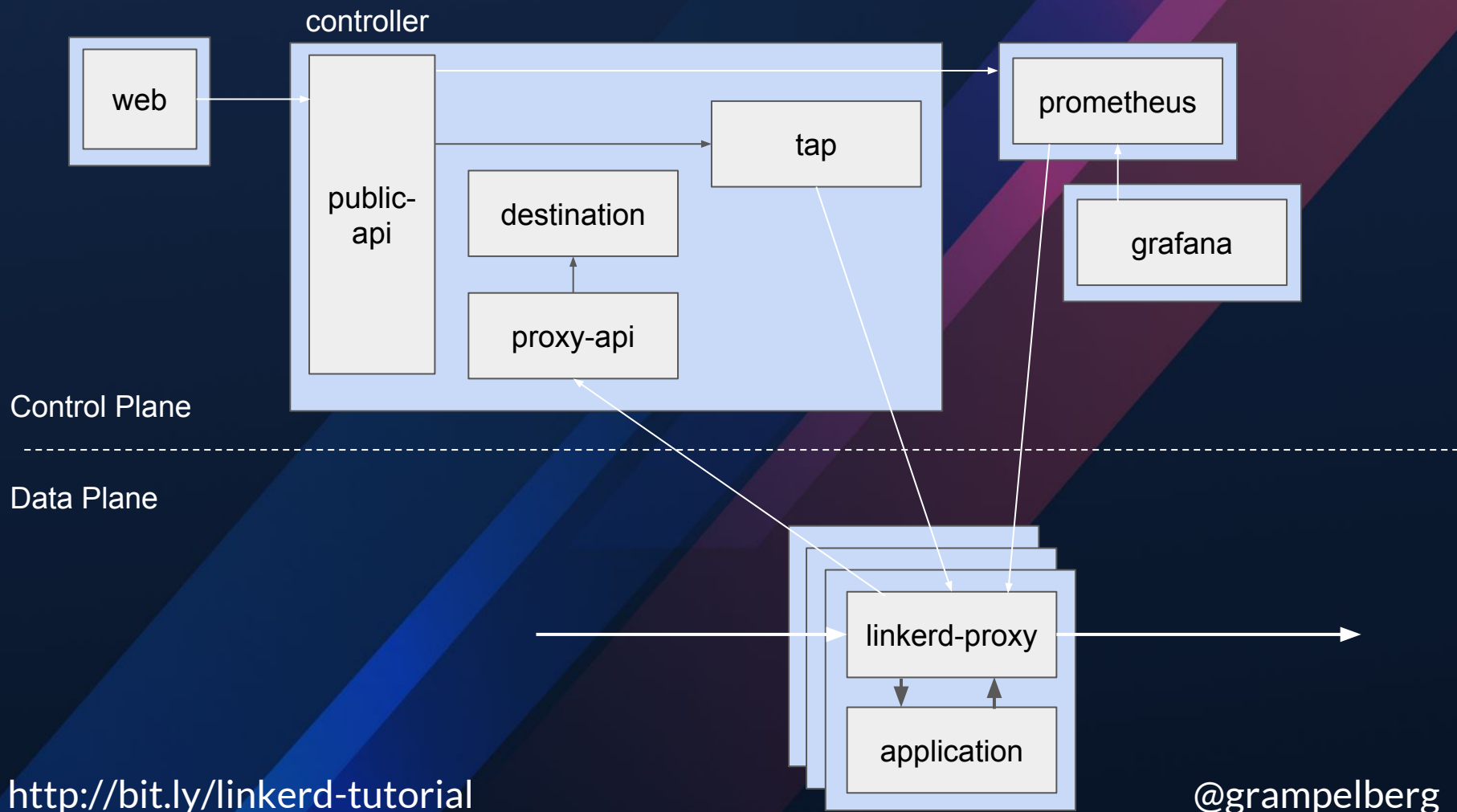


Currently, two parallel branches of development:

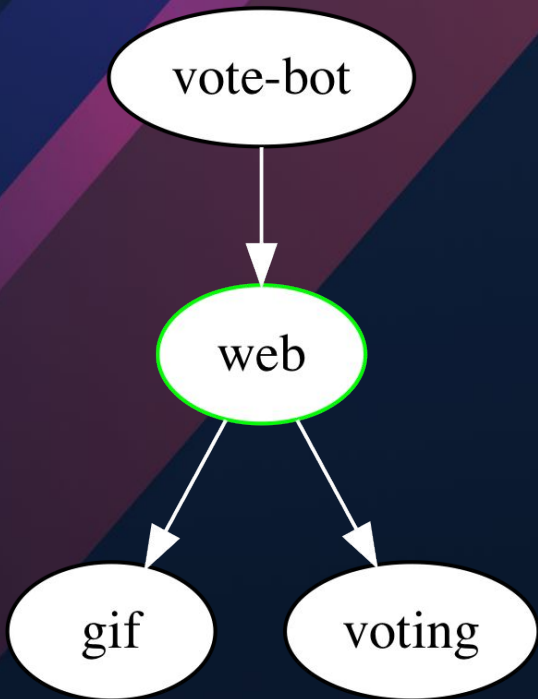
- Linkerd 1.x: powerful, highly configurable, multi-platform (K8s, ECS, Mesos, Consul/Nomad)
- Linkerd 2.x: ultralight, zero-config, Kubernetes-only.







- ☐ Install control plane
- ☐ Add web to data plane
- ☐ Load Grafana dashboard
- ☐ See traffic failures
- ☐ View live request stream





# Linkerd: Live!

<http://bit.ly/linkerd-tutorial>

@grampelberg

- ☒ Install control plane
- ☐ Add web to data plane
- ☐ Load Grafana dashboard
- ☐ See traffic failures
- ☐ View live request stream

Deployments		
Name ↕	Labels	Pods
<input checked="" type="checkbox"/> grafana	linkerd.io/control-plane-c..	1 / 1
<input checked="" type="checkbox"/> prometheus	linkerd.io/control-plane-c..	1 / 1
<input checked="" type="checkbox"/> web	linkerd.io/control-plane-c..	1 / 1
<input checked="" type="checkbox"/> controller	linkerd.io/control-plane-c..	1 / 1

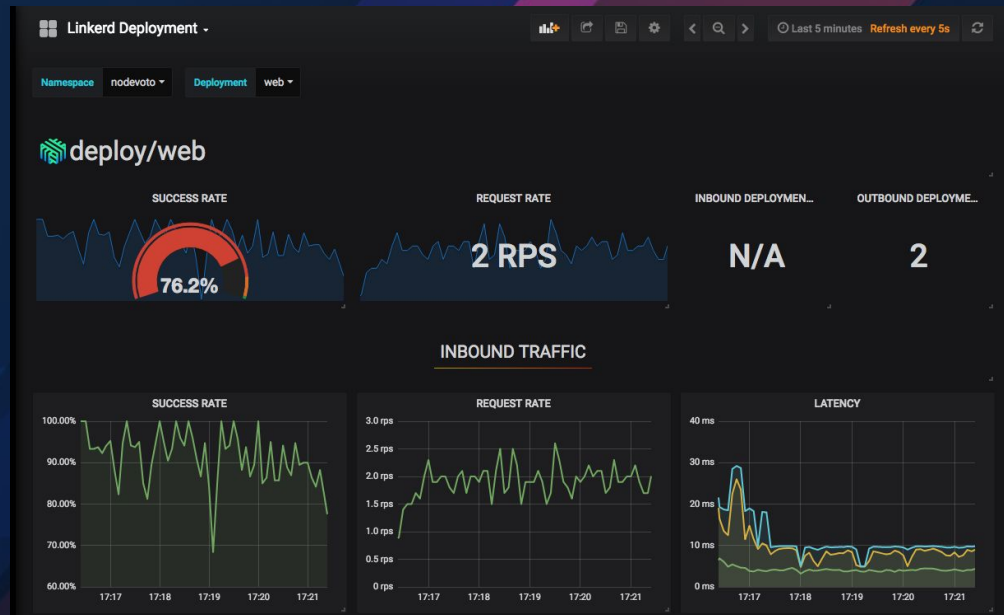
- ☒ Install control plane
- ☒ Add web to data plane
- ☐ Load Grafana dashboard
- ☐ See traffic failures
- ☐ View live request stream

```
hostNetwork: pods do not use host networking.....[ok]
sidecar: pods do not have a proxy or initContainer already injected.....[ok]
supported: at least one resource injected.....[ok]
udp: pod specs do not include UDP ports.....[ok]

Summary: 1 of 1 YAML document(s) injected
        deployment/web

deployment.extensions "web" configured
```

- ☒ Install control plane
- ☒ Add web to data plane
- ☒ Load Grafana dashboard
- ☐ See traffic failures
- ☐ View live request stream



- ☒ Install control plane
- ☒ Add web to data plane
- ☒ Load Grafana dashboard
- ☒ See traffic failures
- ☐ View live request stream

	NAME	PATH ↕	COUNT ↕	BEST ↕	WORST ↕	LAST ↕	SUCCESS RATE ↕	TAP
TO	<a href="#">deploy/gif</a>	/nodevoto.v1.GifService/FindByShortcode	13	918 µs	26 ms	26 ms	100.00%	
FROM	<a href="#">deploy/vote-bot</a>	/api/vote	13	5 ms	39 ms	31 ms	92.31%	
FROM	<a href="#">deploy/vote-bot</a>	/api/list	13	4 ms	36 ms	9 ms	100.00%	
TO	<a href="#">deploy/gif</a>	/nodevoto.v1.GifService/ListAll	12	1 ms	28 ms	6 ms	100.00%	
TO	<a href="#">deploy/voting</a>	/nodevoto.v1.VotingService/VoteCartoonHalloweenGhost	1	830 µs	830 µs	830 µs	0.00%	

- ✓ Install control plane
- ✓ Add web to data plane
- ✓ Load Grafana dashboard
- ✓ See traffic failures
- ✓ View live request stream

Direction ▾	Name	Method	Path	Latency	HTTP status	gRPC status
TO	deploy/voting	POST	/nodevoto.v1.VotingService/VoteCartoonHalloweenGhost	2 ms	200	Unknown
Request Init						
Authority voting-svc.nodevoto:8080			Path /nodevoto.v1.VotingService/VoteCartoonHalloweenGhost	Scheme HTTP	Method POST	TLS no_identity
Response Init						
HTTP Status 200		Latency 2 ms				
Response End						
gRPC Status Unknown		Latency 0 s		Response Length (B) 0		

**Bug: Discovered!**

# Maybe monitoring doesn't have to be tedious?

- Incoming requests (latency, success rate, throughput)
- Outgoing requests and remote APIs (latency, success rate, throughput)
- No code changes!
- Request streams
- Historical data
- Dashboards
- Profit!



Slides: <https://bit.ly/linkerd-sfnode>

Linkerd User Studies (if selected, \$50 Amazon gift card)

- <https://bit.ly/LinkerdUserStudy>

Get started!

- <https://bit.ly/linkerd-get-started>
- <https://bit.ly/linkerd-tutorial>

Join Us!

- Linkerd-users mailing list: <https://bit.ly/LinkerdMailingList>
- Slack: <https://slack.linkerd.io/>

Upcoming Events!

- 12/10: Linkerd in Production 101: <https://sched.co/GyOx>
- 12/11-13: KubeCon: <http://bit.ly/linkerd-kubecon>

<http://bit.ly/linkerd-tutorial>

@grampelberg